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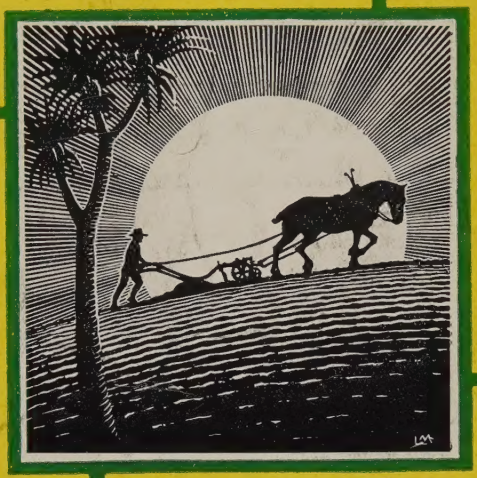

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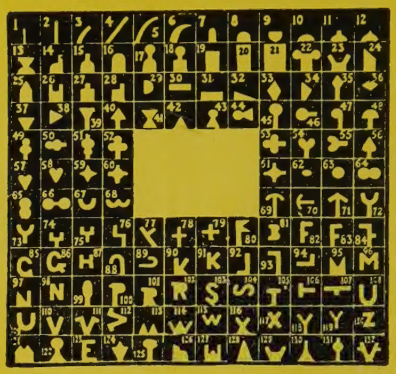

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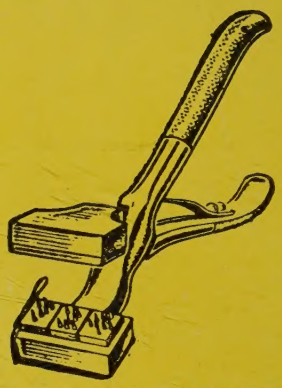

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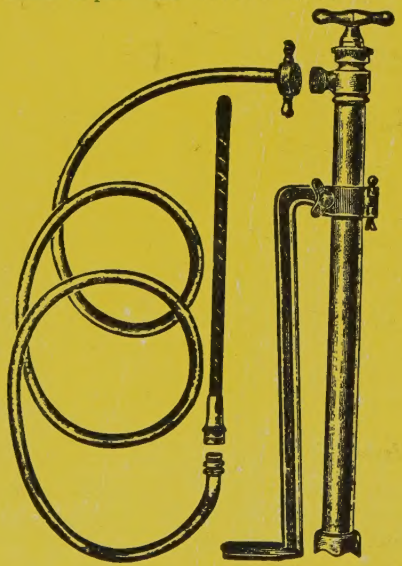

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The New Zealand Journal of Agriculture

Published by direction of the Hon. W. LEE MARTIN, Minister of Agriculture.

Vol. 61 WELLINGTON, OCTOBER 16, 1940. No. 4

The plentiful supply of feed for stock when it is most needed is a vital factor in the Dominion's drive for increased production. The main insurance against a feed shortage and for the maintenance of production is the conservation of surplus growth in the production season as hay and silage.

Here is the Key to Increased Production For The 1940-41 Season

— By —

J. M. SMITH,
Fields Superintendent,
Hamilton.

A VITAL part of this country's war effort is in the production of foodstuffs for Great Britain, and, perhaps in the future when victory is assured, for other parts of Europe as well, in ever increasing quantities. Appeals have been made for increased quantities of bacon, for increased quantities of cheese, and for the maintenance of last year's exports of the other foodstuffs produced in this country.

The answer to these appeals must be immediate—it will be of little use to the war effort of the British Empire to embark on a four or five year plan to build up numerically the herds and flocks of this Dominion. If the increase in production is to be of the greatest service to mankind and civilisation it must be brought about during the 1940-41 season, the season that is now well on its way. The increase must be built up on what might be termed the normal herds and flocks, that is, practically the same number of dairy cows and breeding ewes that were producing during the 1939-40 season.

Fortunately, as far as bacon is concerned, it will be possible—and it is being done—to build up numerically the herds of breeding sows to such an extent that the number of litters dropped in the autumn will show an increase on those of the previous autumn or the present spring, but with the dairy herds and ewe flocks any numerical increase for the current season is out of the question.

Clue to Production

How then, it might be asked, are we to bring about these increases when there are no more animals to produce from? The answer is simple: By enabling the existing stock to produce up to their maximum, a performance that is possible with at least 75 per

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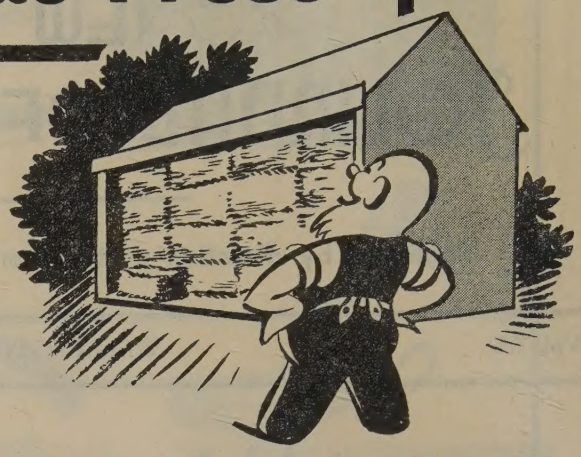

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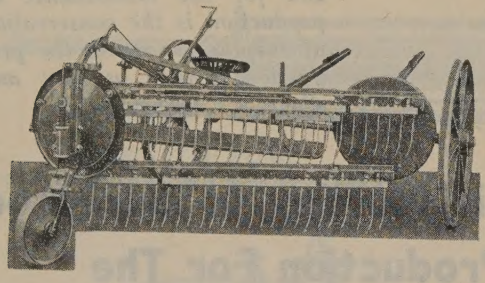

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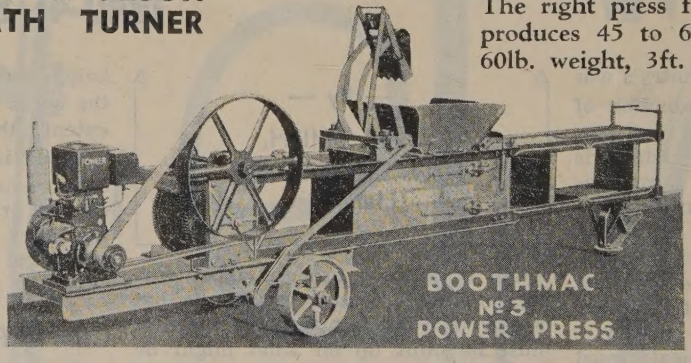

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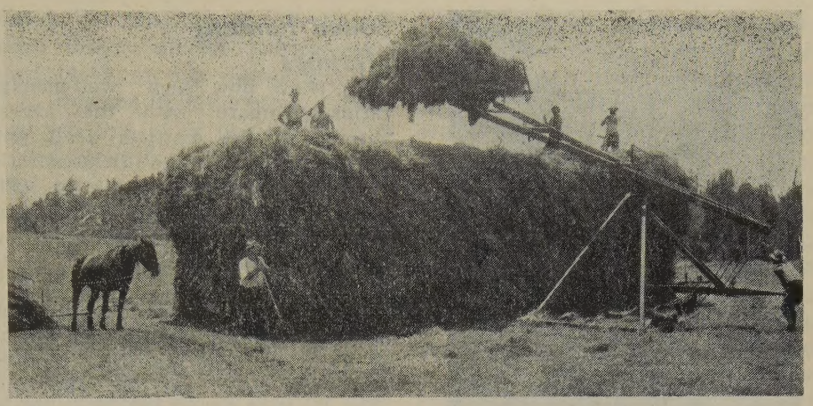
cent. of our herds and flocks. The key to this increased individual production is **BETTER FEEDING.**

It has been suggested—one can hardly think seriously—that the majority of our farm animals are today fed up to their maximum production, but the experience of last autumn, the winter and the early spring give a complete answer to this suggestion, and it is in the negative.

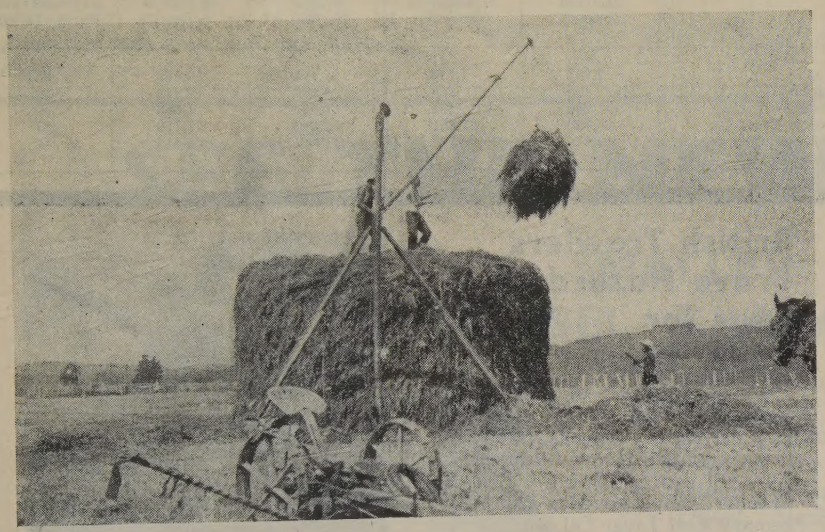
Farmers will recall (mostly with pleasure) the wonderful late summer and autumn growth last season, and how butterfat production was maintained at a high level until late in the autumn. Some dairy companies during the autumn months had increases of from 70 per cent. to 100 per cent. over the corresponding period for the previous year.

Now, reviewing the cold facts of the case, under efficient farming methods it should be impossible for Nature to provide such an increase of 70 to 100 per cent. over a previous more or less normal season, for kindly Nature did it by providing spring-like grass in the autumn. The lesson from this is obvious: We are relying too much on Nature and not taking sufficient steps to ensure that, come what may, we will have sufficient feed for our dairy herds, and by sufficient feed is not meant merely enough to keep the stock alive, but enough to keep them producing at their maximum.



Making a hay stack with the fork type of elevator with the wheeled sweep.

It is granted that no crops we could grow or save would be as good as the grass we had last autumn, but nevertheless there are ample crops, such as maize and turnips, that we can grow, and fodder that we can save in the form of hay and silage, that would bring up our "normal" autumn production to make it impossible for Nature to add a further 70 to 100 per cent. to it.



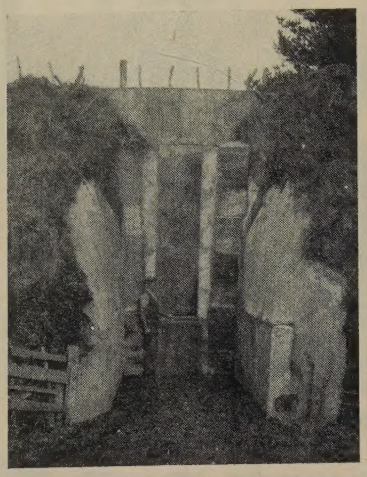
Conserving fodder with an ensilage stack.

Don't Rely On Nature

This season has begun with an early spring after a winter that was very easy on stock, but we must not rely on Nature entirely, however, for she can be a "fickle jade," and just as Britain is preparing to resist an invasion that may never come, so the farmers of this country should prepare for a period of feed shortage, particularly in the autumn, which may never come. But, like Britain, we must be prepared.

As a further illustration of what ample feed means might be cited what

Sow Sutton's Seeds for sure results



A concrete pit which holds approximately 90 tons of ensilage.

appears to be a record lambing season. With good feed of the right type in the autumn, with a mild winter, and with good spring weather for lambing and pasture growth, the fat lamb farmer appears to be on the top of the wave as far as production is concerned. There can be little doubt that the condition of the ewes during and immediately before pregnancy has been a big factor in the very satisfactory lambing percentages and in the forward condition of the lambs. This condition was due almost entirely to the feed position.

As a result of certain experimental work in animal nutrition it is possible to determine just what the ration for a dairy cow through the winter months should be, and consequently how much feed should be provided to maintain a dairy cow in production condition for the winter period.

On the other hand, from the Agricultural and Pastoral Statistics, information can be obtained as to what feed is being provided in the different localities in the Auckland Province, and the discrepancy between what should be grown and saved and what is actually grown and saved is alarming. These figures are a convincing answer to the individual who says that our herds are being fed to maximum production. It is acknowledged that there are farms, and fortunately many of them, where the farm stock are fed to maximum production. This fact makes the position on all other farms relatively worse, for these good farms have brought up the average figure, and it is this figure that is being quoted.

Sound Farming Methods

To show how such well-managed farms compare with the average throughout the districts dealt with, the Northern Wairoa Demonstration Farm at Dargaville is quoted. This farm, which is situated near Dargaville, has been developed from wet, sour, low-lying land, typical of the locality, and has been brought up to a high standard of production by sound farming methods. While such matters as drainage, good pastures, topdressing, good stock, etc., all play their part in production, attention should be focused on the feed provision plan of the farm, for it is the ample provision of feed that is very largely responsible for the honoured position occupied by the Demonstration Farm as far as production is concerned in the district today.

Taking the Counties of Hobson and Whangarei in North Auckland, and the counties of Waipa and Waikato in South Auckland, and using the Northern Wairoa Demonstration Farm as an illustration of efficient farming methods, we find the position set out in the table below.

Assuming that the average yield of hay is 1.7 tons per acre, the average yield of silage 3.5 tons per acre, and the average yield of turnips 40 tons per acre, and that the whole of the feed indicated in the table (with the exception of turnips in the Waipa and Waikato) is fed to the dairy cows alone and that no other cattle or sheep get an ounce of this feed, we find that the lbs. of dry matter per dairy cow for the winter period provided in the different counties is as follows:—

Hobson County 389 lb.
Whangarei County 489 lb
Waipa County 1177 lb.
Waikato County 943 lb
Demonstration Farm 1614 lb

—	Hobson (acres).	Whangarei (acres).	Waipa (acres).	Waikato (acres).	Demonstration Farm (acres).
Hay	2,943	7,176	21,104	19,762	23½
Silage	125	288	5,635	2,445	19½
Turnips	226	543	1,091	1,663	—
Dairy Cows ..	35,949	61,461	72,680	77,790	87
Other Cattle ..	39,876	64,722	43,683	48,843	—

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The assumption that this quantity of feed is available is, of course (with the exception of the Demonstration Farm, where there are no cattle other than dairy stock), far from correct. Only dairy cows are quoted, and, with the exception of the Dargaville Demonstration Farm, other cattle are carried, and these get a considerable quantity of the hay and silage. In the Waipa and Waikato Counties the turnip crop has not been taken into account, as it is recognised that this crop is all utilised by sheep. While the position is probably somewhat similar in the other counties, the dairy cows have been given the "feed credit" for the turnip crop.

Cow's Requirements

The nutritional work previously mentioned showed that the dairy cow producing in the vicinity of 300 lb. of butterfat per annum required a ration giving 22 lb. of dry matter per day for the winter period. Certain experimental work has also indicated that under very favourable conditions pastures will supply up to 10 lb. of dry matter per cow per day during the winter period.

Let us be generous, therefore, and assume that in all the districts mentioned 10 lb. of dry matter per day can be obtained from the pasture lands. If we do this, it is obvious that 12 lb. of dry matter in the form of hay, silage or crops must be found per cow per day by the farmer to bring the ration up to 22 lb.

Let us further be generous and assume that the winter period is of 100 days' duration—the minimum period over which the dairy herd must be fed. Then the dry matter figure for the winter period for the districts mentioned must be divided by 100 to get the daily figure, which can now be interpreted in the following table:—

Remember, we have been generous in our interpretation, giving all the feed provided to dairy cows, with none for sheep or other cattle; crediting every acre of hay or silage saved and every acre of turnips grown at a generous yield; reducing the period of feeding to 100 days; suggesting that all pastures are highly efficient and crediting them with producing 10 lb. of dry matter per day; and even with all this loading in favour of the status quo there is still a shown deficiency in all cases except the Demonstration Farm. It would be more accurate to halve the figure shown, and if we do this and interpret the feed from lbs. of dry matter per day to cwts. of hay

District	Dry matter per cow for winter (100 days).	Dry matter per cow per day.	Dry matter per cow per day from grass.	Deficiency or surplus in lb. dry matter per day.
	lb.	lb.	lb.	
Hobson	389	4	10	8 lb. deficiency
Whangarei ..	489	5	10	7 lb. ,,
Waipa	1,177	11¾	10	¼lb. ,,
Waikato	943	9½	10	2½lb. ,,
Dem. Farm ..	1,614	16¼	10	4¼lb. surplus

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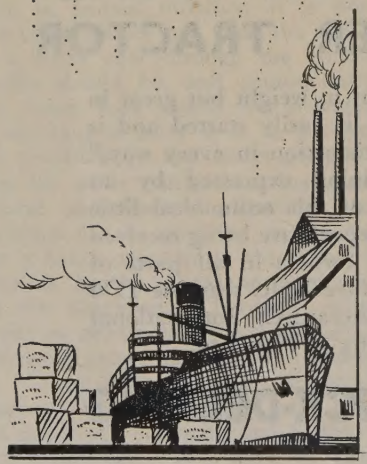

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for the winter period we will find that a generous interpretation of the position is still made.

Disastrous State Of Affairs

On this basis about 12 to 15 cwt. of hay (or its equivalent) per cow should be saved for the winter period. At the Demonstration Farm the equivalent of 14½ cwt. of hay is saved, in the Hobson County 3¾ cwt., the Whangarei County 4½ cwt., the Waipa County 10½ cwt., and the Waikato County 9 cwt.—a rather disastrous state of affairs when one considers that production (and particularly increased production) is bound up with feed provision.

One can safely say that on the average dairy farm the feed provided could be at least doubled.

It is up to the individual farmer to decide whether he is above the average or below it. If he is saving in the vicinity of 12 to 15 cwt. of hay (or its equivalent) per cow he can rest assured that he is well above the average, but when the figure gets down to 4 or 5 cwt. per cow then he is not pulling his weight in the country's effort. In some districts, of course, a run-off is provided, and the feed so provided can be taken as the equivalent of so much hay, but in doing this one must not fall into the common error of reckoning the run-off a good deal better than it is from a feed position point of view.

Farmers have given ample evidence that they are prepared to throw their whole weight into the Dominion's war effort. Their place is undoubtedly on the home front producing foodstuff, which is just as important as munitions or guns. Let them indicate, then, just how earnest they are by seeing to it that every animal on the farm, sheep, horse, cow or pig, is pulling its weight too. This can be achieved only if the animal is fed up to its production maximum.

Hawke's Bay Farmer's Sheep Thrive On Silage

Above.—Having acquired the taste for ensilage, the sheep follow the sledge in anticipation. *Left.* — At the feeding ground the sheep eagerly clamber over the ensilage as it is fed out.

By R. P. HILL,
Fields Instructor, Hastings.

THE necessity for supplying winter feed for stock has never been of greater importance than at the present time. In Hawke's Bay an exceptionally favourable spring is being experienced, and every effort should be made to conserve all surplus pasture into hay or ensilage. The undergrazing of pastures is almost as injurious as over-grazing.

It would appear that this season many paddocks on the sheep farm may have surplus feed in them. This growth may be ensiled either in a pit or stack, and will be extremely useful to carry sheep over difficult periods. As a rule, no great difficulty is experienced in feeding ensilage to sheep, and once they have acquired the taste they seek it eagerly, as the accompanying photographs which were taken on the property of Mr. A. W. Butt, Sherenden, illustrate.

Mr. Butt's sheep farm is hilly to undulating, and where there is an easy paddock it is his custom to try and save hay and ensilage for winter feed. He believes in the pit method for silage. The labour entailed in constructing a pit is not great, and it is his aim always to have a pit full even if he should not require it that winter. A year ago he was feeding out ensilage which had been stored for two years

The paddock referred to here was old pasture and was of five acres. It was topdressed with 1 cwt. of super per acre in the autumn, and a further 1 cwt. per acre was put on in September when stock were removed. The paddock was shut up at the end of September, and mown for ensilage in December. The material ensiled consisted of ryegrass-cocksfoot, sweet vernal, suckling clover and some white clover. The time occupied in harvesting the crop was four days for Mr. Butt and his two boys, and covering the pit with earth a further two days for one man.

Feeding out began on May 27 to 525 breeding ewes. These ewes lived entirely on ensilage and the small picking of grass in the five-acre paddock until June 28, five weeks and four days, and have never come through lambing in better condition. This means that five acres of ensilage kept 525 ewes for 5½ weeks, or, to put it another way, less than three months' surplus growth from an average paddock carried 10½ sheep to the acre for nearly six weeks and did them well.

There was no difficulty in getting the sheep to eat the silage, although as a precaution Mr. Butt sprayed a solution of molasses and water on some of the first silage fed out. This was not necessary, however, as by the second day, practically all sheep were eating the ensilage.

Mr. Butt considers that ensilage is the most economical supplementary feed that **EVERY** farmer with a few acres of easy country can provide.

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This Year's Wool Clip

By
H. M. CHRISTIE,
Wool Liaison Officer, Dept. of Agriculture.

How The Farmer Can Help In The Shed

PLANS have been completed for the handling of this season's wool clip under war time conditions. We are doing everything possible to expedite the shipment of our wool to the United Kingdom, and the appraisal dates have been put forward slightly to enable ships to be loaded and dispatched at the earliest possible moment. The first appraisal is at Auckland on November 14, followed by others at Gisborne, Napier, and Wellington.

Although everything possible has been done since the outbreak of the war to ensure an adequate supply of imported farm requisites, it has not been possible to safeguard the position fully, as some of the imported materials come from enemy occupied countries. At present there is a shortage of soft seaming twine, which is used in sewing wool-packs and seed sacks.

Farmers are asked, therefore, to conserve their supplies as much as possible, because the fibre for this high quality twine is produced mainly in Hungary and Italy, from which, of course, the supply is entirely cut off. All farmers should use lower grade twine wherever possible, thus conserving existing stocks of the better quality twine for essential purposes, such as the sewing of wool packs.

Market Reduced

The over-running of Europe has greatly reduced the scope of the market for Empire wool, and if the terms of the agreement to purchase are similar to those of last year, the new deal must be relatively less favourable to the United Kingdom. She has the problem of disposing of unwanted wool, and not only has part of the market for certain classes of wool disappeared, but there has also been a big shrinkage in her markets for finished wool products.

Great Britain is faced with the marketing or processing of certain classes of wool, the bulk of which in the past has been absorbed by France and other countries now under the domination of Germany. The Mother Country has also lost the substantial market for tops, yarns and tissues which she previously held in Norway, Sweden, Denmark, and Belgium. Thus, of necessity, British and Dominion manufacturers are faced with the necessity of dealing with larger quantities of wool and types which they have not been in the habit of handling.

Producers Can Help

Our own producers can help the manufacturers and others in the trade by doing as much as possible on the farm, not leaving it to be carried out by some other part of the industry already confronted with new difficulties resulting from the war. Sheep-farmers who have in the past neglected proper skirting and preparation of wool for appraisal can help now by seeing to this work.

The mixing in the sheds of bellies with other types of wool results in unnecessary work having to be done elsewhere. The shearers' award requires the removal by the men of the bellies from the fleeces, and there is no valid reason why they should be dumped into the one bale.

The type and price schedule has already been prepared for the coming season, and particular care was taken to ensure that the prices will provide an adequate return to those who properly prepare their wool for appraisement.

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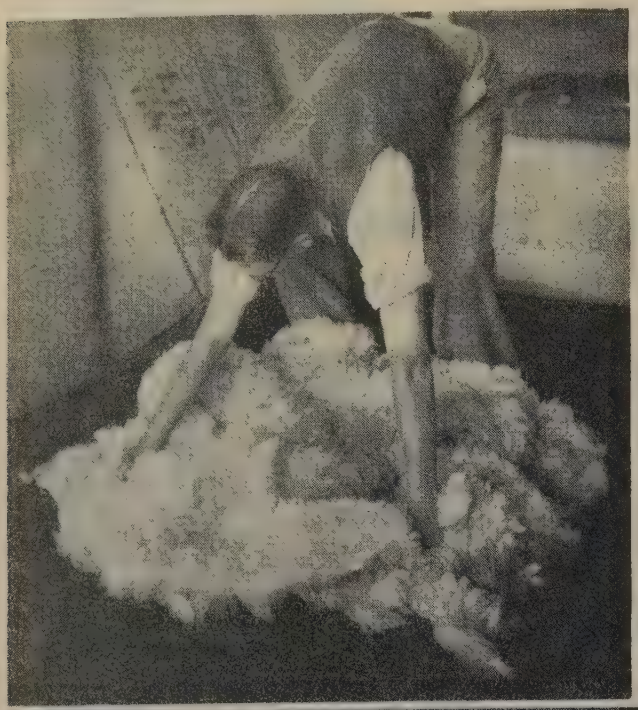
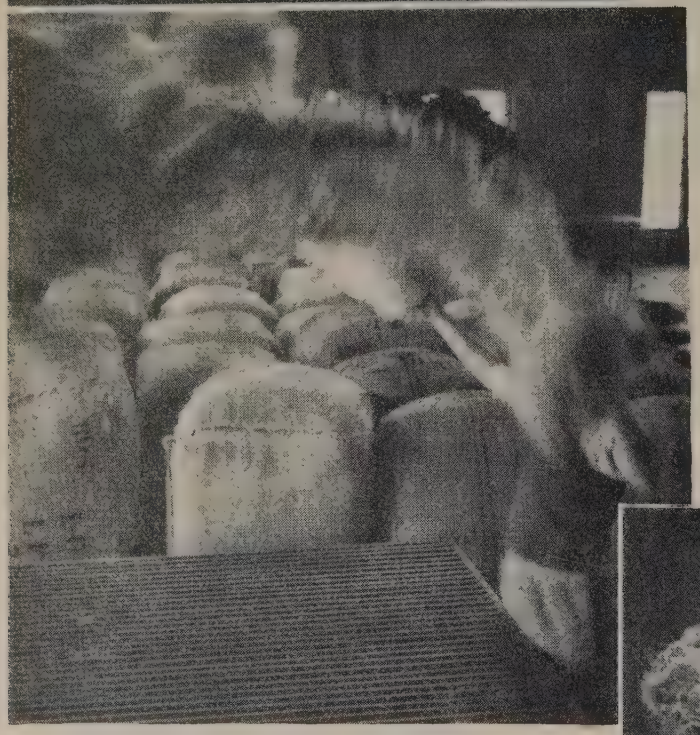


Careful Preparation Is Essential for

Attention to Skirting, Rolling and Classing Pays Good Dividends

By
J. E. DUNCAN,
Wool Instructor, Wellington.



JUST a year ago (October 16, 1939) I wrote an article in the "Journal" on "Handling the Wool Clip," stressing among other things the necessity for proper skirting and classing. At that time the Wool Commandeer Scheme was just getting under way, and as events turned out last season certain technical difficulties prevented an adequate premium being paid on wool which had been well skirted and classed as against clips which had not received this attention. That will not happen again this year.

Those who claim that skirting and classing are not worth while are due for rapid disillusionment if they send their wool in "all in"—that is, with bellies and skirtings left on. Surely a little

Fig. 1.—Picking up the fleece.

Fig. 2.—Throwing the fleece.

Fig. 3.—The fleece on the table ready for skirting.

of the Wool Clip

Best Returns

reflection must show that if the appraisers find inferior wool mixed in a bale of good wool, or skirtings wrapped up inside an otherwise good fleece, they must play safe and protect themselves by offering a lower overall price on that line of wool. It seems hardly necessary to stress something so obvious, yet there are still a few growers who think they will be able to get away with it.

Lack of proper classing comes into the same category, because although the wool in a given bale may be good throughout (in the sense of being free from fault), it may still be mixed in quality. Coarse wool and ewe wool, wool from different breeds of sheep, etc., should not be mixed indiscriminately. These wools each have their particular uses in industry, but they differ in value; therefore if they are mixed in a bale the appraiser cannot tell exactly the proportions of the different types and again is forced to play safe by valuing on the basis of the lowest priced wool in the bale.

Factors Affecting Value

From time to time instances do occur where the price paid for unclassed wool has equalled or even exceed that paid for classed wool from the same district. A typical instance is where farmer "A" claims to have received more for his unclassed clip than "B," his neighbour, who went to the trouble of classing. His claim of a greater price per pound can be correct, but it proves nothing. Such a comparison is valid only if the

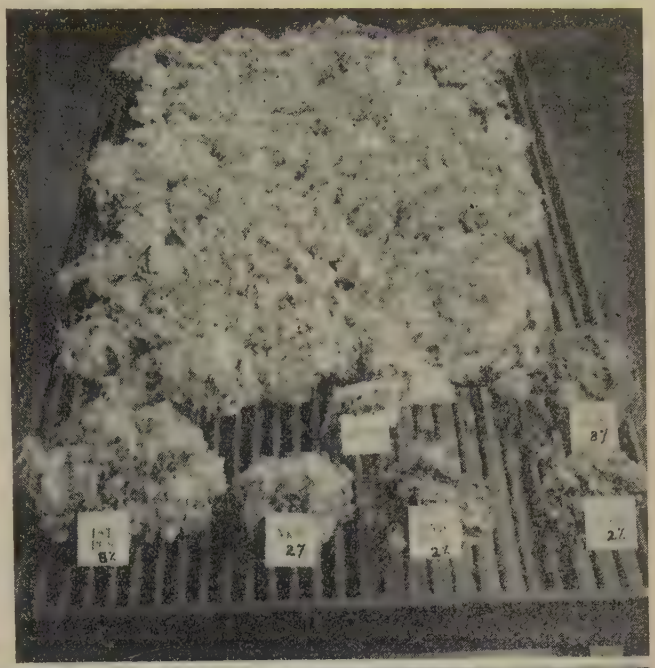


Fig. 4.—Team work does the job quickly.

Fig. 5.—The fleece ready for skirting.

Fig. 6.—Skirtings removed from an average X.B. fleece.

two clips are identical in every respect in regard to count, length, yield, soundness, colour, handle, etc., and are sold in the same sale at the same time. Such an ideal comparison is very seldom found in practice. Many factors, of the utmost importance from the buyer's point of view in determining value, tend to be overlooked by the farmer.

Yield Very Important

The clean-scoured yield of the wool is a case in point. The buyer must be capable of estimating within close limits how much clean-scoured wool he will ultimately obtain from each 100 lb. of greasy wool. To take an example: suppose a particular type of Crossbred wool was worth 16d per pound in the clean-scoured state, it would obviously be worth less in its original greasy and dirty condition. If the yield of this wool was 75 per cent. (that is, 100 lb. of greasy wool yield 75 lb. clean-scoured) the buyer could afford to pay only 12d for it in the grease. If another sample of wool of the same type but heavier in condition had a yield of 69 per cent. the buyer could afford to pay only 11d for it in the grease. (If the clean-scoured value of any wool is known its greasy value is arrived at by applying the formula:

$$\frac{\text{Clean-scoured value} \times \text{Yield}}{100} = \text{Greasy Value.}$$

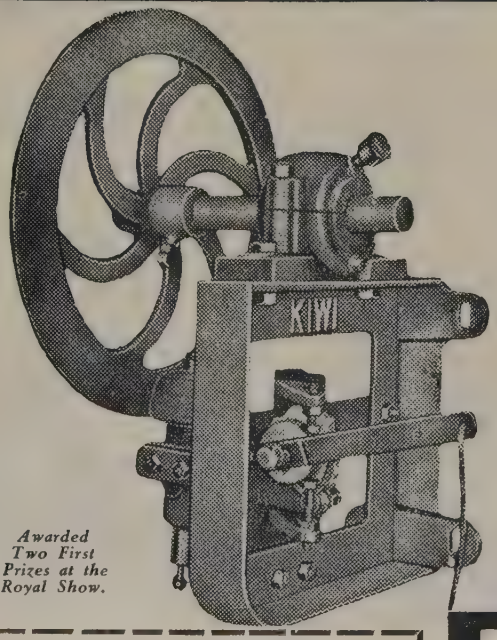
It will be obvious from the foregoing that a difference of 6 per cent. in yield—a difference that the great majority of farmers could not detect—will affect the price by 1d per lb. Other factors have a similar influence. Sometimes a small difference in length will mean that two lots of otherwise similar wools will be put to different ultimate uses.

The bald statement that "classing doesn't pay" will hardly ever bear critical analysis; in fact, what better proof could we have to the contrary than the activities of certain speculators who have made a good living for years past by purchasing unclassed wool at the sales, re-classing it, and selling again at a profit?

Fleece Picking

For the benefit of those who have recently taken up sheep farming or who have previously relied entirely on their broker to carry out the preparation of the clip and now wish to do it themselves, it is proposed to cover briefly the minimum bare essentials in skirting and rolling. Before even this stage is reached, however, the fleece-picker plays an important part. He should keep the board swept and prevent short locks and second cuts from becoming mixed in the fleece wool, and see that the belly wool is also disposed of separately.

The correct method of picking up the fleece is illustrated in Fig. 1. As the fleece comes off the shorn sheep it will generally be found to be lying transversely across the shearing board with the neck end nearest the catching-pen side and the britch nearest the port. In Fig. 1 the fleece-picker has caught hold of a corner of the britch in each hand and is pushing the neck portion in with his feet. The next movement is to sweep the two hands



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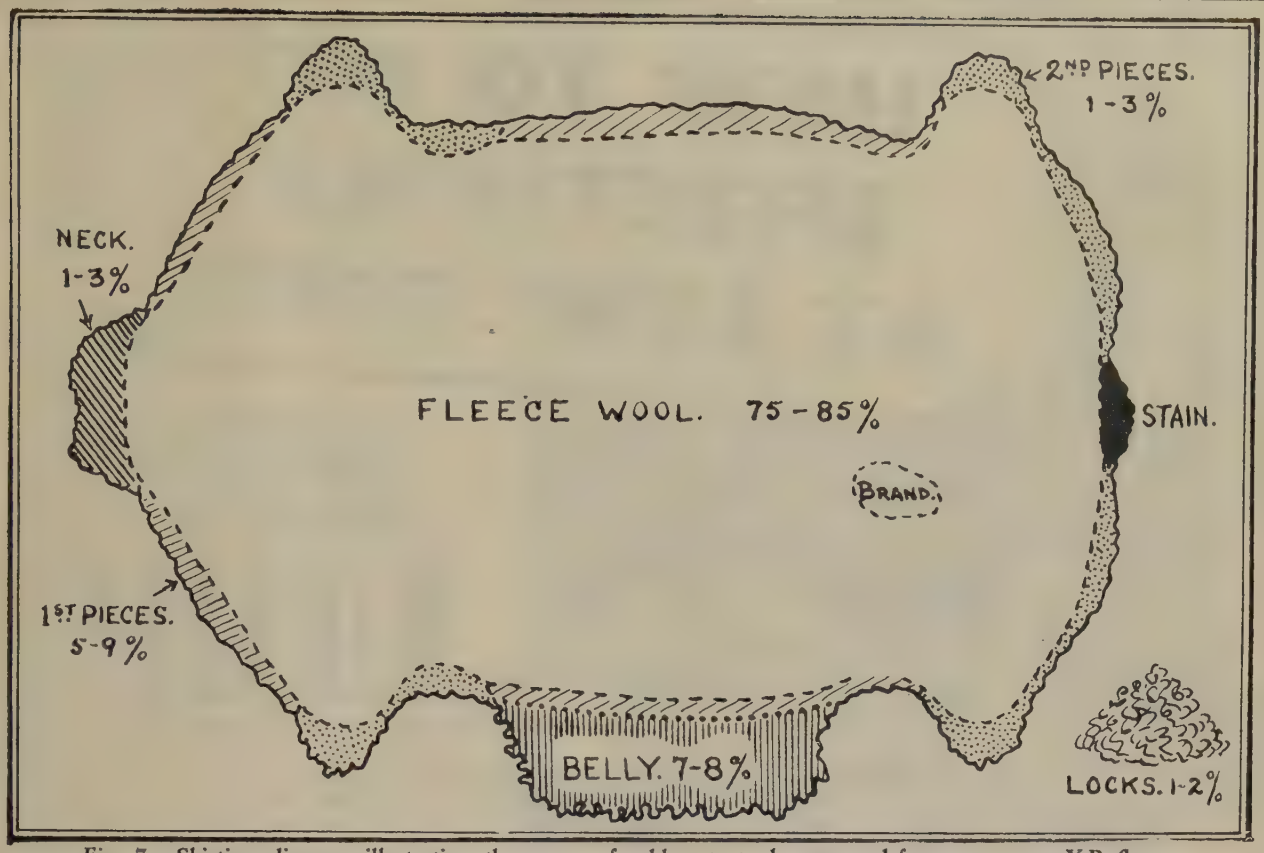


Fig. 7.—**Skirting diagram illustrating the range of oddments to be removed from an average X.B. fleece.**

outwards and backwards each in a semi-circle so that the fleece is completely gathered between them.

Throwing the Fleece

It is then easily picked up and carried to the wool table, where it is thrown forward, as in Fig. 2, so that it lands flat and evenly, as in Fig. 3. This is accomplished by shooting the arms forwards and outwards while still retaining the hold on the britch. It is important that the fleece should land flat and squarely on the table as the skirters can then get right ahead with their job without further moving it.

It seems almost unnecessary to stress that only one fleece at a time should be thrown on the table; yet I have known cases where the fleece-picker got behind with his work and tried to save time by throwing two fleeces on the table. The reason why the table is made with a slatted top is to allow short pieces and second-cuts to fall through among the locks, and this object is defeated if more than one fleece at a time is thrown on it.

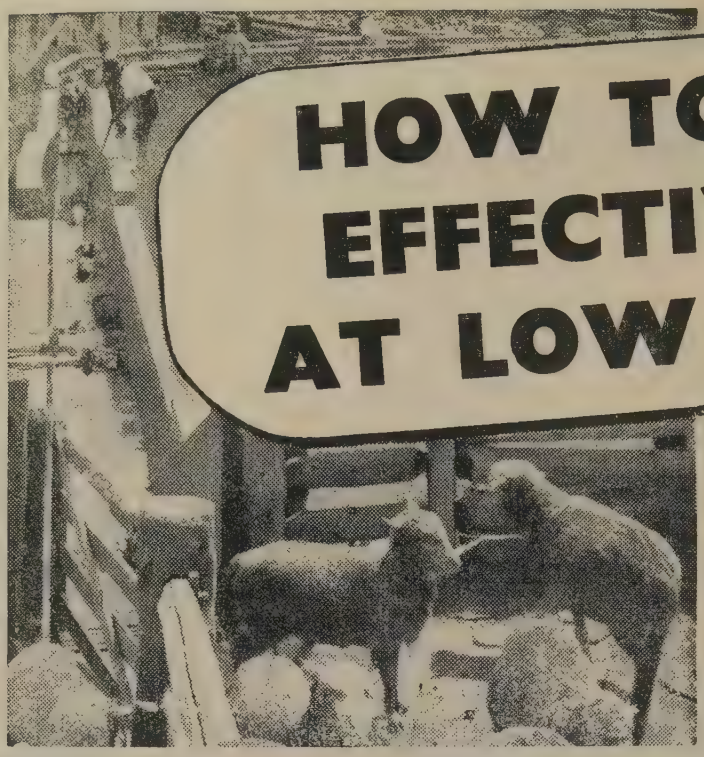
The fleece-picker is responsible for sweeping the board after each sheep goes out the port and before the shearer brings the next one on to the board, so that if he is pushed for time he can easily pick up the fleece in the correct manner and place it to one side against the wall of the catching-pen, later throwing it out on the table.

Skirting.

The object of skirting is to remove all the wool below the average quality of the fleece, thus enhancing the value of the fleece wool and leaving it as uniform in length and quality as possible. Proper skirting calls for careful judgment, as each fleece has to be treated on its merits, but it is nevertheless broadly governed by certain factors, for example, (1) whether the fleece is Crossbred or Merino; (2) whether it is good or inferior; (3) whether it is free, slightly affected with seed, or seedy throughout; and (4) lastly to some extent by the state of the market.

It is not intended here to deal in detail with Merino wool, because this article is intended for the novice, who is unlikely to be handling Merino (which constitutes only some 2 per cent. of our clip), or, if he is, will have the supervision of someone of experience to guide him. The main difference is that with Merino the skirting has to be deeper and heavier than is generally the case with Crossbred wool, because Merinos are densely covered with wool right to the points, and there are more dirty edges to be removed from the fleece. This applies to Halfbred and Corriedale wools to a lesser degree.

Dealing now with wool of the Crossbred type, Fig. 5 shows the fleece spread on the table ready for skirting. In this case the belly wool has been left on (for illustrative purposes only), but usually it is pulled off by the shearer. Fig. 4 shows skirting being done by two men working in unison. They usually start at opposite ends of the fleece and the job is quickly completed, but where a single skirter is employed the principle is still just the same. The diagram, Fig. 7, shows what is removed, but it must be emphasised that there are no hard and fast rules about this, and the diagram merely illustrates the average range found with Crossbred wool. Fig. 6 illustrates in a different way the proportions of the different types of wool removed from the fleece.



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How Much to Remove

That brings in the second point set out above. If a fleece is good except for a small area round the edges it will be well worth while removing all the inferior wool. This will bring in the best overall returns. If the fleece is inferior and dingy throughout it is obvious that no amount of skirting will convert it into a good fleece, and all that can be done is to remove any really inferior and stained wool round the edges.

A similar principle applies to the treatment of seedy wool. Any small amount of seed around the points and edges should be completely removed, as it will greatly detract from the value of the fleece wool if any is left in it. Again, if the fleece is seedy throughout, skirting heavily will not remedy the position, and the amount of wool taken off is then determined by other factors, such as stain and dirt. Also, it must be remembered that where seed is confined to a few fleeces throughout the clip, the skirtings from these should not be mixed in with the free skirtings from the rest of the clip, or they will reduce the value of the whole lot.

The fourth point does not apply just now, as all our wool is being bought on a fixed price schedule, but when prices are very low heavy skirting is obviously not worth while, as the resulting increase in value of the fleece wool will be small and the value of the skirtings so low that the more wool that goes into this category the lower the overall returns. Nevertheless, even under these conditions it is still necessary to do a certain amount of skirting, to remove wool which is much inferior to the rest of the fleece.

1st and 2nd Pieces

It will be noted from Fig. 7 that the skirtings are divided into several sorts. Starting from the neck, it will be seen that a small amount of wool is usually removed in this region because it tends to be light and weathered. This wool is not always kept separate—in fact it is sometimes run in with the 1st Pieces—but if there is a quantity it is worth keeping it separate, as, because of its lighter condition, its value is greater. On the other hand, the neck is often seedy, which is another reason why it should be kept separate.

The 1st Pieces consist generally of all the wool removed along the shoulders and flanks with the exception of the small area behind the armpit. This goes into the 2nd Pieces because of its dirty nature and heavy condition. Do not skirt more heavily than necessary in the shoulder region; remove just the dirty edges, as the shoulder is generally the best and most valuable portion of the fleece.

The coarser, matted and dirty wool on the points is all removed, and, together with the coarser fringe from the britch, goes into the 2nd Pieces. The amount of wool which requires to be removed from the britch varies a good deal, but in some cases it will be found that this wool is markedly coarser than the rest of the fleece and frequently hairy as well, so that it is better to remove any wool of this type completely.

Stains, etc.

There is frequently a stained area in the centre of the britch, and if this is pronounced it is better kept separate, as it will detract from the value of the 2nd Pieces. If there is any quantity it can be run in with the stained wool that should also have been picked out from the bellies, and can then be sent in to the broker for binning.

Occasionally, it is also necessary to remove a strip of wool from along the centre of the back where it is very

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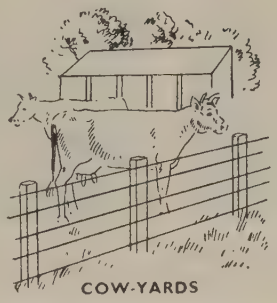
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Fig. 8.—The skirted fleece ready for rolling.

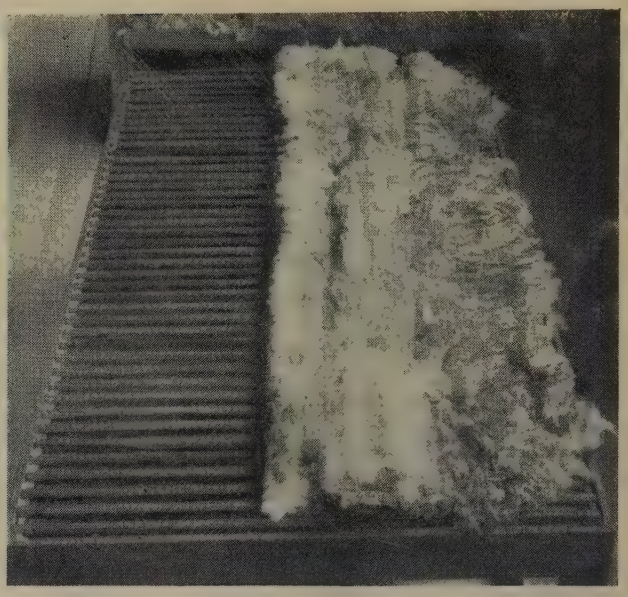

Fig. 9.—The first fold.

earthy or sandy, as it will detract a good deal from the value of the fleece if left in. If the brand is still showing it should either be removed entirely, which is the safest and quickest way, or else the pigmented portion should be clipped from the end of the staples with a pair of shears.

Skirting has been emphasised because it is important. It should always be done at shearing time in the owner's shed, because then the fleece is in the most favourable condition for doing the job properly. Once the fleece has been rolled the original arrangement of the staples is to some extent altered, and after unrolling in the broker's store efficient skirting is no longer nearly so easy.

At any time, therefore, it is a wise plan to complete the skirting at shearing time, but now more so than ever, because our wool must be dispatched with the least possible delay, and broker's stores will not be able to cope with large quantities of unskirted wool during the short period available, and with possibly reduced manpower. For that reason it is up to the farmers to do all they can to assist in this direction, and there is no doubt that they will.

Rolling.

Rolling the fleece before pressing is practically universal today, although this has not always been the case. Rolling should serve two main functions—firstly to reduce the fleece to a compact form for easy handling, and secondly to give it an attractive appearance. Strangely enough, some of the methods of rolling practised in this country do not achieve the latter objective. It is a business axiom that the vendor should display his goods in the most attractive manner possible; therefore it is not dishonest for the grower to roll his fleeces in such a way that the best wool is showing. It will not deceive the buyer with his wide experience, because he can easily find the bad wool if he wants to, but it will ensure that the best wool is not overlooked. In general, the shoulder wool is the best part of the fleece, and the back wool and britch the poorest.

Various Methods

There are several methods of rolling, but the two described below are actually all that are required, depending on what is subsequently to happen to the wool. If the fleeces are properly skirted on the farm they do not have to be unrolled again in the broker's store, even if they have to be classed or binned when they arrive there. In that case the following method is recommended.

Method No. 1

Fig. 8 shows the skirted fleece lying on the table ready for rolling. The following operations are now carried out in sequence:—

(1) If it is not reasonably square across the neck and britch a little can be folded in at the two ends to make it so, and also the near edge of the fleece can be folded in a couple of inches to make it straight, although this is not essential.

(2) Fig. 9 shows the next step. Fold the fleece over about a third of its

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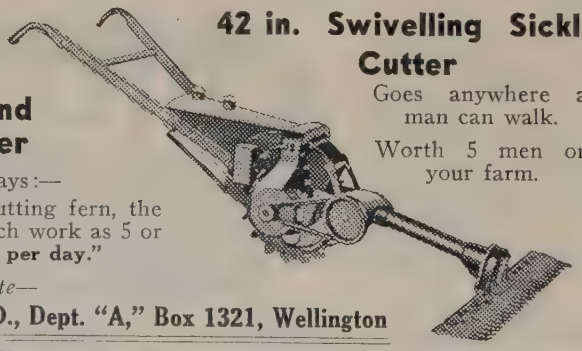

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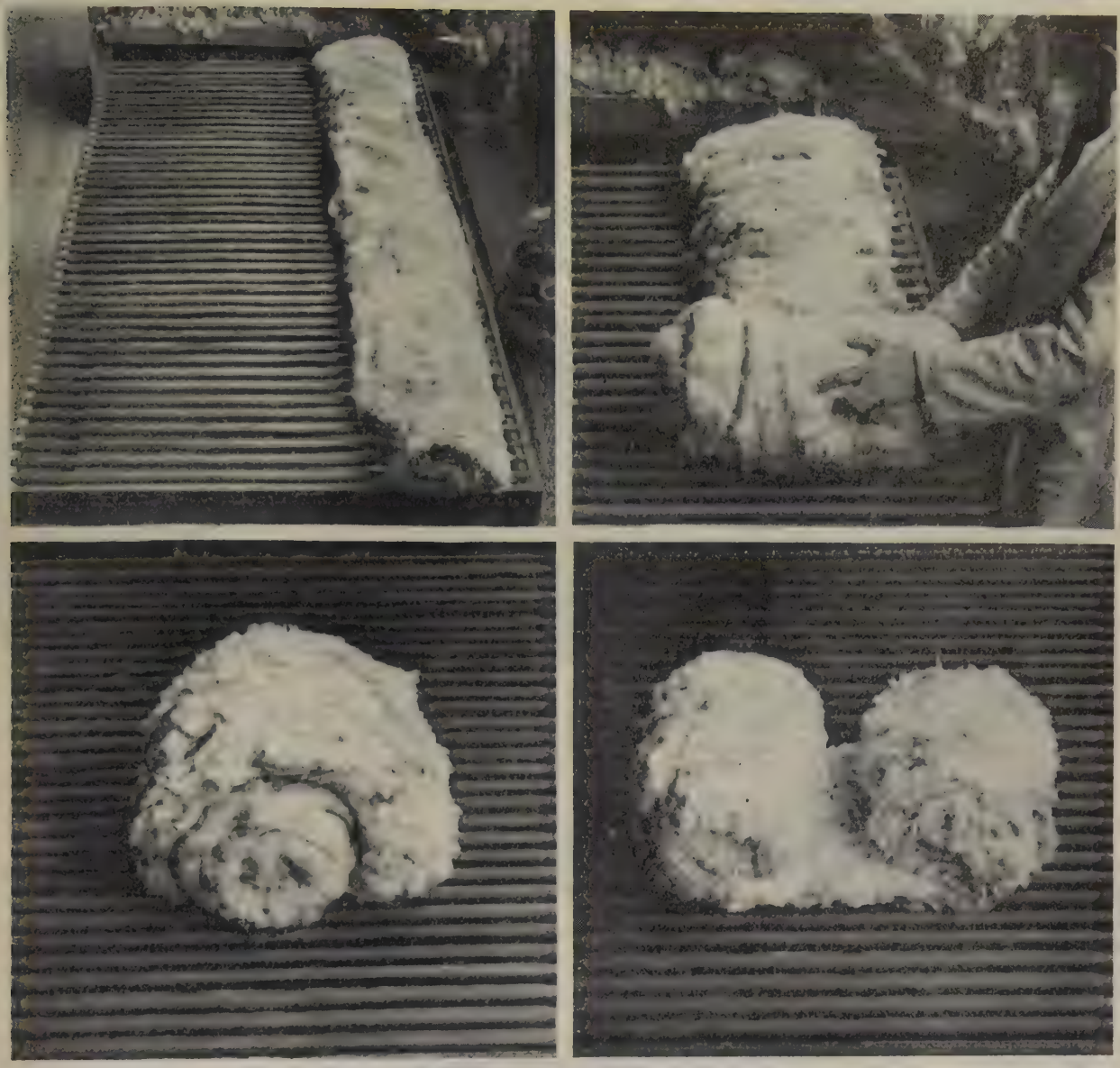

Fig. 10.—The second fold. *Fig. 11.*—Rolling from britch to shoulder. *Fig. 12.*—The finished product. *Fig. 13.*—Another method—recommended only where the wool has to be unrolled again in store.

width towards you; this gives a strip of wool lying "flesh-side" up.

(3) Now fold this doubled portion over again towards you on top of the remaining third, as shown in Fig. 10. The fleece is now lying ready for rolling with the back wool on top, running as a strip down the centre.

(4) Begin at the britch and roll the fleece tightly all the way to the shoulder, as shown in Fig. 11.

(5) The finished roll is shown in Fig. 12. It is neat and compact, and will stand quite a lot of handling without coming undone.

Reference to the diagram Fig. 14. E, F, G, and H, shows clearly that by this method the back and britch wool is rolled in and the shoulder wool is displayed to best advantage.

Method No. 2

When skirting is not done on the property (although ample reasons have already been given why it should be done there) the following method should be adopted.

Proceed as described in the first method up to stage (3), where the fleece is folded into a narrow strip as shown in Fig. 10. Then, instead of rolling from britch to shoulder, roll from **both** ends so that the fleece ends up as shown in Fig. 13. This has the advantage that the fleece is very easy to undo in the wool store, and it is not torn about in the process. After it has been skirted it can be rolled again by Method No. 1.

Methods Not *To Use*

The top portion of Fig. 14 shows one of the methods **not** to use if the

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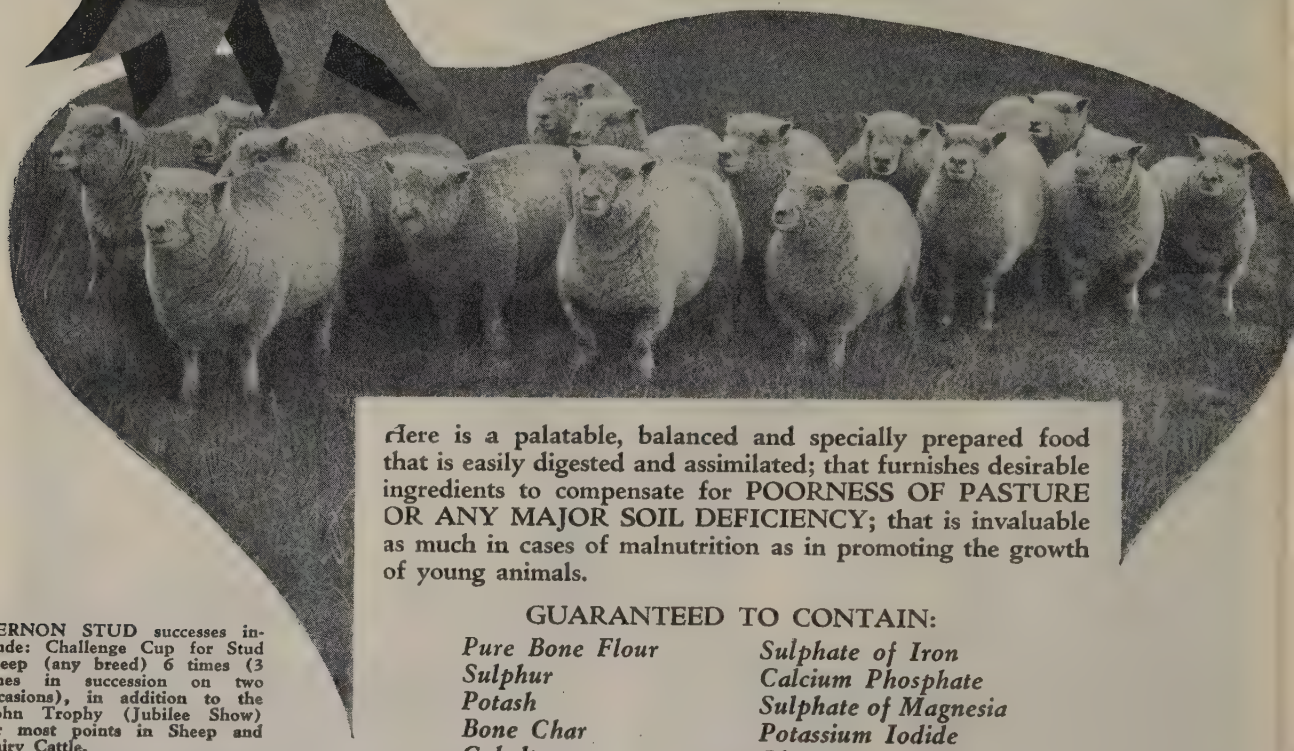

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wool is being finally rolled on the farm. The figure marked A represents in diagrammatic form the skirted fleece ready for rolling. If it is then folded in as shown at B or the other method shown at C, and rolled as at D, practically all the best shoulder wool will be hidden and the strip of inferior wool along the back will be plainly displayed. The method shown on the lower part of the diagram (E to H) is no more trouble to carry out, and is much more effective in presenting the best wool.

A method practised by some farmers and often described as the "shoulder-roll" is carried out by folding the fleece as at B (Fig. 14), with the exception that the shoulder end is left more or less spread out. The fleece is then rolled from the britch, and when the shoulder end is reached this portion is more or less "draped" over the rest of the fleece. It certainly shows this part to advantage, but makes the fleece very difficult to unroll later on,

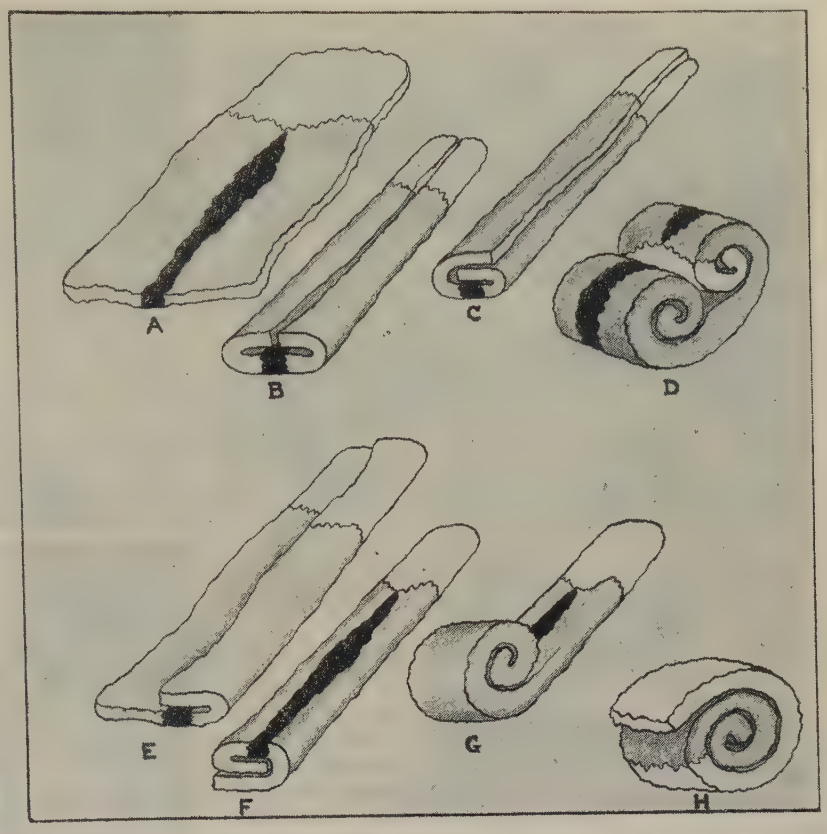

Fig. 14.—Different methods of rolling illustrated. The white portion represents shoulder wool, the grey portion the bulk of the fleece, and the black strip the inferior wool along the back.

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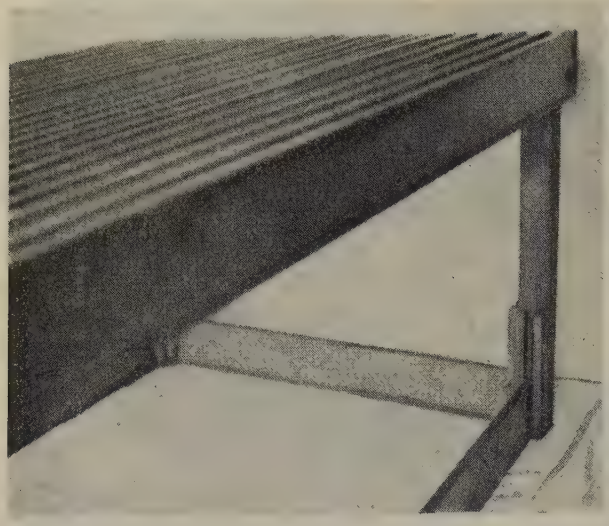

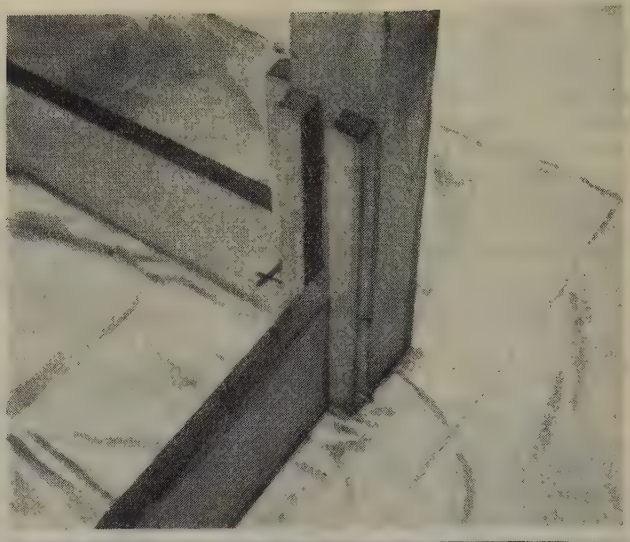

Fig.15.—A useful type of wool table. *Fig. 16.*—Details of attachment of board to table leg. *Fig. 17.*—Wool table hinged to wall.

and should never be used where the fleece will have to be unrolled again in the store.

The Wool Table.

A good wool table is essential for quick and efficient handling of the fleeces. A fault frequently found is that the table is too small, so that a large fleece will hang over the edges, which makes proper skirting difficult. The top of the table should not measure less than 9 ft. x 4 ft., and 3 ft. will be found a convenient working height.

There is no hard and fast rule about the construction of the top, and several designs are shown in the photographs. The type shown in Fig. 15 will be found to give good service. It is of the dimensions quoted above, and the slats run lengthways. These slats measure 1 in. by 1½ in., and are set on edge, the spaces between them being also 1 in. wide. In addition, they are slightly bevelled (after the manner of the gratings in a woolshed floor), being narrower at the bottom, so that the locks fall clear very readily. The sides and ends of the table are of dressed 6 in. x 1 in. timber, and there is a cross-brace of the same dimensions half-way along to support the slats.

The legs are of 3 in. x 3 in. dressed timber, and are each attached by a ½ in. bolt so that they can be folded up like a trestle bed when the table is not in use. Fig. 16 gives details of the 6 in. x 1 in. boards set in around the bottom of the table to prevent the locks from scattering. It will be noticed that they can be easily removed merely by withdrawing the pegs (in this case 4 in. nails) which hold them in place. All timber used in the construction of a wool table should be smoothly dressed to prevent any wool from adhering.

Other Types

In Fig. 17 is shown another type of table frequently found in small sheds. It is hinged to the wall, and can be folded up when not in use. This type is not recommended, however, (except in very small sheds where speed is not of great importance), because it is impossible to get round it, and where two men are doing the skirting this is essential. It will be noticed in Fig. 17 that the table top has been covered with a large sheet of hessian so that lambs' wool can be picked over. The table is well lighted, but the window must have a southerly aspect so that only diffused light reaches the table. Direct sunlight must be avoided, as it interferes with efficient classing. A better arrangement is to have the table away from the wall and lighted by indirect light from a skylight.

It will be noticed in Figs. 8 to 13 that the table shown is fitted with wooden rollers each 1½ inches in diameter and free to turn in slots in the sides of the table. Some people claim these to be an advantage because as they revolve the locks fall clear more readily. In practice, they generally very quickly become jammed with dirt and bits of wool, and are no better than the fixed slats.

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The Superintendent of the Pig Industry discusses

Producing Pigs Without Dairy By-products

This article outlines the general practices of a number of farmers in the South Island who are producing pigs successfully and profitably without dairy by-products. The pigs are fed on meals and home-grown crops, and adequate attention it not only paid to their feed requirements but also to housing and general management.

DURING the last two or three years a number of men in different parts of the South Island have made a success of pigs without dairy by-products, and in each case these men are being inundated with inquiries. Neighbours who are fortunate enough to become acquainted with the procedure of these men are beginning to follow their example.

The basis of sound feeding in the absence of dairy by-products is that pigs of all ages at and after weaning get 2 lb. of high quality meal daily. This is made up of ½ lb. of meat-meal and 1½ lb. of barley, pollard, wheat, oats or peas. In addition, the pigs get as much as they will eat of roots or grass or other unharvested crops. Any shortage of these home-grown crops that leaves the pigs hungry will quickly wreck the whole undertaking.

Amounts of Feed Daily

Dry Sows.—A dry sow during pregnancy requires 5 to 6 lb. of feed daily. She gets 2 lb. as meal and grain meal and the remainder can be provided by grass, when this is green and freshly growing, or by 30 to 40 lb. of roots daily (equal to 3 to 4 lb. of feed). When no grass or roots are available 3 to 4 lb. of lucerne chaff can replace the roots or grass. This amount of feed will keep a sow in good condition. When the weather is warm and the grass is abundant, little or no meal may be required. Watch the sow's condition and adjust the amount of meal accordingly.

Sows with Litters.—Sows with litters require about 4 lb. of meal for themselves and 1 lb. per piglet daily. Thus, a sow with six pigs needs 10 lb. of feed daily, and one with eight pigs 12 lb. of feed. Give two-thirds of this as meal and grain and the rest as roots or grazing feed, 1½ to 2 lb. of meat-meal and 6 to 8 lb. of barley, pollard, peas, oats or other grain daily to the sow and litter. Start the litter on the creep at three weeks old with about 1 oz. of meat-meal and 2 oz. of crushed grain per piglet daily, increasing the amounts each week until at weaning the pigs are getting ½ lb. of meat-meal and 1½ lb. of grain daily. As the creep feed increases, cut down the meal allowance to the sow over the sixth, seventh and eighth weeks. Some feed up to 1 lb. of meat-meal and 1 lb. of grain-meal at eight weeks.

Weaners to Baconers.—At weaning the foundation of 2 lb. of meal will feed the pig adequately; at five months an additional 20 to 25 lb. of roots or grazing (equal to another 2 to 2½ lb. of feed) daily will be required; at seven months 30 to 35 lb. of roots or grazing will be required. It is usually advisable to increase the meal ration to 3 or 4 lb. over the last month of fattening. When there is an abundance of roots to be disposed of, or where the paddock crops are particularly succulent, it is possible to reduce the meal quantity to 1 lb. or even to ½ lb. daily, **provided the pigs being fed are more than four months old.** When ½ lb. only is being fed, it should be meat-meal only. **In no circumstances is it advisable to reduce the meal ration below 2 lb daily for pigs less than four months old.**

As a general guide to feeding, a pig requires 2 lb. of feed daily at eight weeks old, increasing by ½ lb. each fortnight to 6 lb. at 24 weeks and remaining at this amount until the pig is ready for slaughter. While the foundation meal remains constant at 2 lb. daily, the roots given should be increased generally by 5 lb. per pig each fortnight (10 lb. of roots equals 1 lb. of feed) to a maximum of 40 lb. for light baconers.

Feed Required for Sow and Litter

In the best circumstances 1 lb. of carcass can be produced for 4 lb. of feed; in average circumstances it is produced for 6 lb. of feed, and in careless circumstances 8 lb. of feed are used to produce 1 lb. of meat.

To produce two litters up to the weaning stage a sow requires about 3 cwt. of meat-meal, 1 cwt. for each litter and 1 cwt. for the eight months that she is dry, along with about 9 cwt. of meal, 3 cwt. for each litter and 3 cwt. for the dry period plus the grazing from a quarter of an acre of good grass and about 2 tons of roots.

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To take weaners on to baconers in about five and a half months a further ¾ cwt. of meat-meal and 2 cwt. of grain-meal are required per baconer, along with about 20 tons of roots and grazing—say half and half for the two litters.

These are the amounts required in average circumstances. The amounts are quite elastic. Some farmers use one and a half times as much to produce this number of pigs; others can get along with about two-thirds of these amounts.

Price and Quality

Like other stock, pigs can be profitable only when their feed supply is costless or cheap and when it is of high quality. Dairy by-products are both costless and of high quality, and for these reasons pigs and cows are naturally associated.

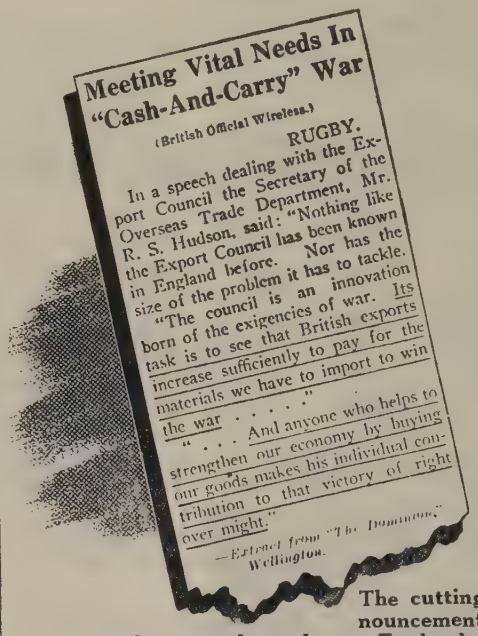
From time to time different farmers have attempted to produce pigs without dairy by-products, replacing them by home-grown and purchased feeds. Too often they have neglected to make that nice adjustment between price and quality, either being over impressed by the need for high quality feed and consequently making their feed supply too dear for profits, or at the other end of the scale in an attempt to make it cheap, using feed of so low a quality that the pigs could not grow on it.

Others have failed because of lack of accommodation. This results in pigs being overcrowded, insanitary and a nuisance about the place. Because of their lack of interest, some have made a failure of pigs even with cheap feed and good accommodation. The care by the owner is the third leg of the stool, and is just as important as the feed supply and the accommodation.

Accommodation

Many pig ventures are failures because nothing has been spent on accommodation; the pigs are dirty, overcrowded and insanitary, and the owner loses interest. Where the open air system is used, at least one house and run per sow is required if no fattening accommodation is provided. To provide a shelter, fences, gates, water supply, yards, troughs, etc., a capital outlay for new materials of from £20 to £35 is required per sow.

Where the climate is cold and damp and a fattening house is essential two farrowing houses for every three sows


Meeting Vital Needs In "Cash-And-Carry" War
(British Official Wireless.)
RUGBY.
In a speech dealing with the Export Council the Secretary of the Overseas Trade Department, Mr. R. S. Hudson, said: "Nothing like the Export Council has been known in England before. Nor has the size of the problem it has to tackle. "The council is an innovation born of the exigencies of war. Its task is to see that British exports increase sufficiently to pay for the materials we have to import to win the war . . . . . "
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is usually enough, but when allowance is made for the cost of the fattening house the capital outlay per sow still remains at between £20 and £35 per sow. This amount frightens many people who have not given the matter much thought, but it is a recognised capital cost by those who have made pig farming a business venture. There is often enough material on many farms to build one or two sow houses, and cases are known where the cost of housing per sow is as low as £2.

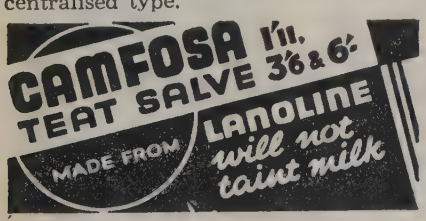
More fail through poor equipment than through excessive capital expenditure. The interest and depreciation on a £40 per sow layout amounts only to 6s to 7s per baconer produced.

Open Air Accommodation

When open air accommodation is provided the mistake most frequently made is having the runs too small. The grass gets eaten and worn off them, and runs become just useless pieces of land. It is better to have them large enough for the grass to persist. Any grass not required by pigs can be eaten down with other stock. Sow runs from a quarter to a third of an acre hold the grass and are not too small to be cultivated. These larger runs also ensure clean conditions.

The open air system is ideal where the natural drainage is good, but on flat land it is probably better to build a central farrowing unit with radiating fences than to allow pigs access to grass. Where central units are built attention must be paid to drainage and water supply for washing down. Plenty of slope is required on the floors of pens and provision should be made for taking the drainage away from the house. This adds a little to the cost, but there are compensations in the lessened cost of a centralised building and in the greater ease of feeding.

Those who have not already seen Bulletin No. 177, "Layout and Construction of Modern Piggeries," which is available at all offices of the Department of Agriculture, should obtain a copy before they begin to build new houses, whether of the open air or centralised type.



Management

As pointed out previously 1 lb. of carcass may be produced for 4 lb. of meal; the whole success of pig production depends on doing this. Unfortunately, it is not possible to say precisely how this result can be obtained, but it is usually obtained by careful observers who pay attention to detail.

The writer has been very impressed by the importance of contentment in pigs. At Messrs. Studholmes' farm the sow farrows in a pen and the pigs are left together as a litter often in the same run until slaughter. There are no upsets at weaning, no change of quarters or companionship, no fighting, no interruption in the feeding, no checks from birth to slaughter, no overcrowding of accommodation, and no overstocking of paddocks.

One has to see the consequences of these things to realise the importance of this small detail of having sufficient accommodation and of leaving pigs in accustomed and clean surroundings. Fences last longer, because pigs do not try to get through them; grass lasts better, because contented pigs don't tramp it out around fences, feeders and gates; disease cannot easily spread; pigs grow without a check, and convert feed into meat most efficiently.

Labour Required for Pigs

One of the most frequent objections raised to keeping pigs is the amount of labour they require. In actual fact, this attitude can hardly be sustained. One man can attend to 30 to 40 sows and produce from them £1,000 to £1,500 worth of pig-meat as baconers, or he can attend to 50 to 80 sows producing weaners.

On buttermilk farms one man looks after anything between 400 and 800 pigs at a time, and with proper conveniences there should be little difficulty in looking after 30 sows and their progeny, say 200 to 300 growing pigs. The actual feeding of this number requires about two hours' work daily. On the basis of one man to 400 baconers, the labour costs work out at about 15s per pig, and as baconers are on the place for 30 weeks the labour cost per pig is about 6d per week.

In setting out this information an attempt is being made to satisfy those genuine inquirers who are thinking of increasing their pig stock. No attempt is made to state the relative profits from pigs as against other classes of farm production. There is a certainty, however, that pigs can be a reliable and continuous source of income to the man of natural organising ability who is prepared to invest capital and feed the pigs on the lines suggested above and give them the appropriate attention. Most farms could keep a sow and produce a dozen baconers with profit to themselves and to the nation now and for the next few years.

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What Price Can Be Paid For Meals On Dairy Farms?

By
M. J. SCOTT, Superintendent of the Pig Industry

CONSIDERABLE attention is being paid to the increased price of barley for pig feed, and in so far as this may tend to keep the price as low as possible it is all to the good. One frequently hears the remark, however, that at the increased price barley is too dear to use and as this attitude tends to decrease the amount used it is definitely harmful.

Because profits from pigs are determined by such things as the earliness or lateness of the milk season, by the size of litters, by the fitness of pigs on hand to use the feed supply available, by the amount of home-grown feed and time at which it is used, by the health of pigs, by the weather and by the attention given to pigs as well as by the amount of meal used, it is almost impossible for a man milking, say, 40 cows who uses only £20 worth of pig-meal to say how profitable the use of this meal has been, or whether his profits would be influenced by using a different amount of meal, or still to say what price he could pay for meal to ensure a profit.

Placed in this position, he is forced to argue by analogy, contrasting prices paid here with those paid for meals in Great Britain or Denmark or some other country—where meals are usually cheaper than here—or else to assess the value of meal by the fair assumption that every 6 lb. of meal produces an additional 1 lb. of meat, which, worth 6d. less 20 per cent. for overhead and 20 per cent. for labour, leaves 6 lb. of meal worth 3.6d., equivalent to barley at 2s. 6d. per bushel. Both arguments are useful in advocating low-priced feed, but neither is sound in deciding whether or not meal should be used, or how much of it should be used at different prices.

The Real Basis of Profit

As has been pointed out for a number of years, the profitability of using meal along with dairy by-products can be measured only by the value of skimmilk after paying for purchased or grown feeds used along with the dairy by-product.

The following tables show the residual value of a cow's milk after paying both for meals, at various prices, and for home-grown feeds approximately at the rate of 5s. per ton. These tables have been prepared from the returns submitted by farmers over the last three years, and are worth careful study.

Farm returns were arranged into four groups:—A. Those who used meal for pig feed at the rate of less than ¼ cwt. for every cow milked (the average was about 16 lb. per cow for this group). B. Those who used less than ½ cwt. per cow (the average for this group was 45 lb. per cow). C. Those who used less than 1 cwt. per cow milked (average 87 lb. per cow). D. Those who used more than 1 cwt. per cow (average 4 cwt. per cow).

Important Results

Although tables are hard to read, the importance of the results warrants their being set out in tabular form.

Table showing the value of a cow's milk after making allowance for home-grown feed and for purchased meals when these cost per ton:—

	£8	£10	£12	£14
Group A ..	34/8	34/4	34/1	33/9
Group B ..	40/10	40/1	39/4	38/6
Group C ..	40/5	38/11	37/4	35/10
Group D ..	41/5	33/6	25/7	17/8

Residual value of skim milk per cow (500 gals.)

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In Group A (92 farms), after paying for meal used and for home-grown crops, the earning values of skim-milk per cow when pork is 6d per lb. are 34s 8d, 34s 4d, 34s 1d, 33s 9d, when meals cost £8, £10, £12, £14 per ton respectively. An increase of £6 per ton for meal reduces the earning value of skim-milk by 11d per cow.

In Group B (74 farms) a cow's milk, as before, is worth 40s 10d, 40s 1d, 39s 4d, and 38s 6d per cow, when meal prices are £8, £10, £12, and £14 per ton respectively. An increase of £6 per ton reduces the return per cow by 2s 4d. It is still more profitable to use meal at this higher rate even when it is £14 per ton than it is to use it at the lower rate as in group A, when it is only £8 per ton.

In Group C (70 farms) a cow's milk is worth 40s 6d, 38s 11d, 37s 4d, 35s 10d, when meals are £8, £10, £12, and £14 per ton respectively. An increase of £6 per ton reduces the value of a cow's milk by 4s 7d, but again it is more profitable to use meal at this rate even when it is £14 per ton than it is to use it, as the A Group does, at any price.

In Group D (31 farms) a cow's milk is worth 41s 5d, 33s 6d, 25s 7d, and 17s 8d when meal is £8, £10, £12, and £14 respectively. An increase of £6 per ton decreases the value of a cow's milk by 13s 9d. Meal can be used in this way only when it is about £8 a ton, a fair price in the grain growing districts.

These results are the average of many farms in each case. Within each group there are a number of men who are getting returns as high as 60s per cow after paying for meals even at £14 per ton and for home-grown crops, and there are others getting as low as 15s per cow.

Level of Meal Supply

From these returns and from numerous other returns it can be definitely stated that the earning value of skim-milk is generally at its highest level when a maximum amount of home-grown non-meal feed is used, and when this is done the most profitable level of meal supply for pigs is about 1 cwt. per cow. When less home-grown feed is used the most profitable level is about ½ cwt. per cow. At both these levels of meal feeding the returns per cow are greater than when ¼ cwt. of meal per cow is used for pigs even though the price of meal is £14 per ton.

While it is obvious that the lower the price of meals the greater the profit, there appears to be no sound reason for reducing the amount of meal used for pigs to less than ½ cwt. per cow, or 1 cwt. per cow where plenty of roots or grass are used for pigs, even though the price of meal is £14 per ton.

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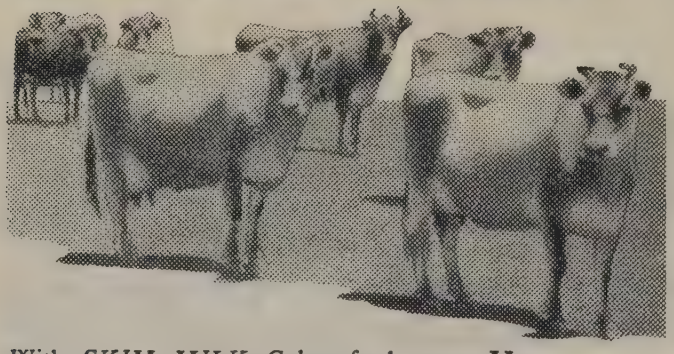

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Critical Test Of An Alleged Cure For Mastitis

Negative Results Recorded In All Cases

By J. P. JAMES,
Veterinary Research Officer,
Animal Research Division.

THE Minister of Agriculture was approached recently by Mr. J. H. Bishop, Morrinsville, with a view to having a mastitis treatment which had been devised by him reported on by the Department. The Minister agreed that the method of treatment would be tested by a Veterinary Research Officer, under the following conditions:—

(1) Full particulars of the treatment and the claims for it were to be supplied prior to the test.

(2) The test was to be designed and supervised by a Veterinary Research Officer, although no objection was offered to Mr. Bishop conducting the actual treatment in the presence of this officer.

(3) The Department reserved to itself the right to publish the results of any test conducted.

On February 10, 1940, Mr. Bishop wrote to the Minister accepting the conditions laid down. The following extract from his letter gives Mr. Bishop's description of his treatment and his claims for it:—

Mr. Bishop's Letter

"An airtight container is used. It is fitted with an inlet tube at the bottom and an outlet tube at the top. The container is filled with approximately a gallon of rain water and one standard drop of aether is added. Through the inlet at the bottom air is pumped and the minute particles of aether, water, and air are conveyed, by means of a rubber tube and special needle, to the quarter. (N.B. It is not necessary to refill the atomizer after every treatment, as it will keep in a fit state for use indefinitely. I make it a rule to refill it once every month unless I have to treat a special case.)

"I claim that it is possible to reduce milk tested as 6 count under the microscope to normal. This is done, without loss of production, as follows:— (1) The infected quarter is milked out and then inflated by the method described above, one drop of aether being used. (2) At the next milking the quarter is completely milked out. (3) At the following milking the quarter is milked out and inflated again. This time the strength of the treatment is increased by one drop further. (4) The milking process is repeated. The machines may be used now. (5) If, after three days, the test does not show sufficient improvement, further treatment with the two drops may be used until definite progress is evident. Old-established cases and old cattle of the hardier breeds may require stronger treatment.

"In all cases where no pyrectic or pyrexia conditions prevail, the treatment is similar, except that it is advisable to use only one drop in the atomizer for two or three treatments, as it apparently stimulates the secretion of milk at this strength. When the milk has cleared and the quarter has reached its full strength, an extra drop of aether should be used to reduce the count.

"A cow in the pyrexia state should be treated in the following way: (1) Do NOT milk out quarter. Inflate quarter and allow to stand for twenty minutes. (2) Milk out completely. (3) Drench the cow to prevent the case from becoming pyrectic. (4) Repeat in 24 hours. If inflammation has sub-

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sided no further drenching is required. Leave small quantity of milk in quarter. (5) On the third day the quarter should be milked out and treated in the ordinary way.

"A cow in a pyrectic state should be drenched every twelve hours with 40 drops of Phytolacca in a pint of water until the fever subsides. It should then be treated as a pyrexia case in the manner already described.

"My claims for the above treatment are: (1) That 95 per cent. of the infected cows can be reduced to normal as shown by the microscope. (2) Cases of discoloured milk, etc., without any complications, can be reduced to 3 count or normal in a few days. (Eighty-five per cent. of this class.) The only cases that need any special care are pyrectic and pyrexia cases, and the average farmer should be able to treat 80 per cent. of either class successfully."

Claims Modified

In subsequent negotiations with the author, Mr. Bishop somewhat modified his claims. He was inclined to make reservations in regard to the type of cases to be treated, and especially objected to treating cases which had previously been treated by any form of infusion which he defined as "any internal treatment of the udder." The following two extracts are taken from a letter from Mr. Bishop dated March 19, 1940:—

"I am therefore prepared to treat cows in the chronic state and all old cases that don't come under the heading of having been previously treated by infusion, provided the quarter has not been dried off and allowed to shrink so that there is either no fluid or insufficient to warrant treatment."

"I believe that 60 per cent. of old and chronic cases can be brought back to useful milk, subject as to quantity by the amount of tissues remaining undamaged by the disease."

Outline of Test

The test was conducted in one of the herds at the Ruakura Animal Research Station. This enabled cows of known history to be used, and afforded ideal conditions for the test, because all the cows were under the complete control of the investigator. It was hoped to include all classes of mastitis in the test, but this could not be done, as only chronic cases were available, with the exception of one acute case which developed during the course of the test. However, the cases treated were quite typical of those which are seen in ordinary commercial herds, and belong to the types which cause the greatest commercial loss to the dairying industry.

The means of diagnosis used was the leucocyte assessment test devised by Dr. C. S. M. Hopkirk, of the Wallaceville Animal Research Station. By means of this test it is possible to determine the concentration of pus cells in the milk of affected quarters. Quarters are classified into seven classes, numbered 0 to 6. Classes 0, 1 and 2 may be regarded as normal. Classes 3 and 4 are doubtful, and may be expected to develop mastitis at a later date. Classes 5 and 6 are definitely affected with mastitis. This test is referred to by Mr. Bishop in his letter of February 10, so that it is apparent that he was quite prepared to accept the results as judged by it.

All the cows were examined frequently before the start of the treatment, 13 examinations being made in the course of 10 days. Examinations were made at daily intervals during the course of the treatment, and at longer intervals for 22 days after its conclusion.

Farmers are responding to the call for increased production to the utmost of their capacity . . . but are their herds? Q.E.D. is on very active service in the war against hard quarters and udder troubles. Drench promptly with Q.E.D., and experience the same satisfactory results as the hundreds of farmers who bear testimony to its remarkable merits.
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Cows Included

The following cows were included in the test:—

Treated by Mr. Bishop.—Six cows with a total of seven affected quarters, all of which were classified as chronic clinical cases. Four cows with one affected quarter each, classified as chonic sub-clinical cases.

Untreated Controls.—Five cows with one affected quarter each, classified as chronic clinical cases. Four cows with one affected quarter each, classified as chronic sub-clinical cases.

A chronic clinical case may be defined as one in which the disease has been present for some time, and in which there is either some obvious change in the milk, or some palpable change in the udder, or both. Generally, no great amount of heat or pain is present. A chronic sub-clinical case differs from a chronic clinical case in that there is no obvious change in either the milk or the udder. In both classes leucocyte assessments of 5 or 6 are frequently obtained.

None of the test cows had been previously treated with udder infusions this season. All the treatments were administered by Mr. Bishop himself, and followed closely on the lines of his description of the treatment.

Results

The general results of the test are set out in the accompanying tables, Table 1 giving the leucocyte assessment and Table 2 the condition of the cows' udders and the naked eye appearance of the milk.

There was no improvement in any of the treated or untreated chronic cases as judged either by the leucocyte assessment test or by palpitation of the udder and eye examination of the milk. The only possible exception among the treated cows was "Lexie," which at the last examination 22 days after the final treatment gave a leucocyte assessment of only 3, but such an assessment was not uncommon in this quarter before treatment began. Such fluctuations are fairly frequently noticed in chronic cases, and a good example was seen in the untreated cow "Jeanetta."

The acute stage of mastitis developed in the left forequarter of "Coralie" on April 16. Mr. Bishop administered his medicinal treatment, but gave no in-

TABLE 1.—Leucocyte Assessments.

		Date																											
		1/4		3/4		4/4		5/4		8/4		9/4		10/4		11/4		12/4		13/4		15/4		16/4		17/4		18/4		23/4	
Cow.	Quarter.	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Chronic Clinical Treated.																															
Precious Belle	RF	* 6		**6**	**6**	**6**	**6**	4	**6**	5	**6**	**6**	**6**	4	5	5	4	5	**6**	**6**		**6**		**6**		**6**		**6**		* **6**	
Precious Belle	RH	6		3	5	**6**	**6**	**6**	**6**	**6**	5	**6**	6	4	6	5	5	5	6	5		6		6		5		6		5	6
Margaret Rose	RF	6			**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**		**6**		**6**		**6**		5		**6**	
Ramona ..	LF	6			**6**	**6**	**6**	**6**	**6**	6	**6**	**6**	**6**	**6**	5	**6**	4	6	**6**	**6**		**6**		**6**		**6**		4	5	**6**	
Petronelle ..	LF	6			**6**	5	5	**6**	**6**	**6**	**6**	**6**	**6**	5	4	5	5	6	**6**	5		**6**		6		**6**		4	6	**6**	
Alicia ..	LF	6			6	**6**	**6**	**6**	6	**6**	5	6	**6**	6	**6**	**6**	**6**	**6**	**6**	5		6		**6**		**6**		**6**		**6**	
Hyacinth ..	RF	4	5	5		4	5	**6**	6	6	4	**6**	**6**	6	5	6	5	5	6	6		6		**6**		**6**		**6**		**6**	
Chronic Clinical Not Treated.																															
Precious Belle	LH	6		5	6	4	6	**6**	**6**	5	4	**6**	**6**	**6**	5	5	4	**6**	5	**6**		5		3		**6**		5		3	
Winsome Lass	LF	6			**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	6	**6**	**6**	**6**	**6**	**6**		**6**		**6**		**6**		**6**		**6**	
Nettie ..	RH	6			**6**	**6**	3	**6**	6	**6**	**6**	6	5	6	4	**6**	5	6	5	**6**		6		5		**6**		**6**		6	
Thyra ..	LF	6		6		**6**	**6**	**6**	6	**6**	**6**	6	5	3	5	5	–	5	**5**	**6**		5		5		**6**		5		**6**	
Hyacinth ..	LH	5		4	4	3	6	6	3	**6**	4	**6**	**6**	6	5	5	5	6	5	4		**6**		**6**		5		**6**		5	
Chronic Sub-clinical Treated.																															
Lexie ..	RH	6		–	3	3	3	3	4	3	4	3	5	4	3	5	5	4	5	4		**6**		**6**		**6**		**6**		5	
Hyacinth ..	LF	4		3	5	5	4	5	6	**6**	4	4	4	6	**6**	5	**6**	5	**6**	5		5		5		**6**		4		5	
Coralie ..	LH	5		–	3	3	5	4	5	6	4	4	4	**6**	5	5	5	6	5	4		4		5		**6**		4		5	
Zelda ..	RF	6		–	5	6	4	**6**	5	**6**	5	6	4	4	5	5	5	5	6	**6**		**6**		**6**		**6**		**6**		**6**	
Chronic Sub-clinical Not Treated.																															
Scotch Lass ..	LF	5		4		2	5	5	4	6	5	4	4	3	3	3	5	6	5	5		3		4		5		4		4	
Bonnie Maid	RF	6		6		4	5	3	4	4	4	5	5	6	4	**6**	4	6	4	**6**		4		6		**6**		5		**6**	
Thyra ..	LH	4		6		4	4	4	5	5	**6**	**6**	6	4	5	5		5	5	**6**		6		4		4		**6**		5	
Jeanetta ..	RF	6		3		2	2	2	3	4	3	3	4	3	4	3	3	3	3	3		3		3		–		3		2	

		Date																											
		24/4		26/4		30/4		10/5																					
Cow.	Quarter.	M	E	M	E	M	E	M																					
Chronic Clinical Treated.																													
Precious Belle	RF	**6**		**6**	**6**	**6**		**6**																					
Precious Belle	RH	**6**		5	6	5	6	**6**																					
Margaret Rose	RF	**6**		**6**	**6**	**6**		**6**																					
Ramona ..	LF	**6**		**6**	**6**	Dry		–																					
Petronelle ..	LF	**6**		**6**	4	**6**		**6**																					
Alicia ..	LF	**6**		**6**	**6**	**6**		**6**																					
Hyacinth ..	RF	**6**		**6**	**6**	**6**		**6**																					
Chronic Clinical Not Treated.																													
Precious Belle	LH	**6**		**6**	**6**	**6**		**6**																					
Winsome Lass	LF	**6**		**6**	**6**	**6**		–																					
Nettie ..	RH	**6**		**6**	6	–		6																					
Thyra ..	LF	**6**		6	6	–		–																					
Hyacinth ..	LH	5		–	5	6																							
Chronic Sub-clinical Treated.																													
Lexie ..	RH	5		3	4	–		3																					
Hyacinth ..	LF	5		2	5	5		5																					
Coralie ..	LH	**6**		5	6	**6**		**6**																					
Zelda ..	RF	**6**		**6**	**6**	**6**		**6**																					
Chronic Sub-clinical Not Treated.																													
Scotch Lass ..	LF	4		4	3	5		–																					
Bonnie Maid	RF	5		**6**	3	6		6																					
Thyra ..	LH	**6**		5	3	–		**6**																					
Jeanetta ..	RF	3		2	3	3		3																					

Key.

Figures represent leucocyte assessment results:—0, 1, 2, normal; 3, 4, doubtful; 5, 6, definite mastitis. Figures in black mean that on that occasion the milk was abnormal in appearance on standing.

Note: From the time of the first treatment to the last record is about one month.

* Condition of milk samples not noted.

Treatment Notes.

11/4 1st treatment given. One drop of fluid to one gallon of rain water.

12/4 2nd treatment. Strength as for first treatment.

13/4 3rd treatment. Chronic cases with no symptoms were treated with 2 drops of fluid per gallon of rain water.

15/4 4th treatment. All treated cases except Lexie received treatment with 2 drops of fluid per gallon of rain water.

16/4 5th treatment. All cases treated with 2 drops of fluid to one gallon of water.

17/4 6th treatment. Following quarters treated: Margaret Rose RF. Ramona LF. Hyacinth RF and LF. Lexie RH.

18/4 7th treatment. Following quarters treated: Precious Belle RF and RH. Ramona LF. Alicia RF. Hyacinth RF. Lexie RH.

TABLE 2.—Condition of cows' udders and naked eye appearance of milk 10 days before and one month after treatment.

A. CHRONIC CLINICAL CASES.

		Condition 1/4/40.	Condition 10/5/40.
Precious Belle	R.F.	Definitely knotty. Giving watery discoloured milk.	**Still knotty.** Milk showing no change.
Precious Belle	R.H.	Quarter knotted. Milk abnormal on standing.	Quarter still knotted. Milk still high count with occasional abnormal appearance.
Margaret Rose	R.F.	Quarter very swollen, uniformly all over and hard. Milk like serum with clots.	Quarter still swollen. Milk like serum with clots.
Ramona ..	L.F.	Quarter somewhat shrunken. Not knotty, milk abnormal.	Quarter showed no change. Milk still abnormal.
Petronelle ..	L.F.	Quarter shrunken slightly. Not hard. Milk giving deposit sometimes.	No change in quarter. Milk still abnormal on occasions with high count persistent.
Alicia	R.F.	No marked change in udder. Milk usually abnormal.	Udder condition unchanged. Milk still abnormal.
Hyacinth ..	R.F.	Quarter appeared normal. Milk high count and occasionally with deposit.	No alteration in udder. Milk still giving deposit on standing

B. CHRONIC SUB-CLINICAL CASES.

		Condition 1/4/40.	Condition 10/5/40.
Lexie	R.H.	No easily discernible normality. Perhaps little thickening in gland high up. Milk normal appearance, count irregular.	**Udder unchanged.** Milk usually normal, count irregular.
Hyacinth ..	L.F.	Quarter shrunken, but milk normal in appearance.	No change. Count remaining high.
Coralie ..	L.F.	Udder and milk normal, count high. Acute stage of mastitis developed in L.F. on 16/4. The cow was given 40 drops of Phytolacca, and 40 drops on the 18th. No infusion treatment. Acute symptoms commenced to subside on 18th and udder appeared normal on 23rd.	**No alteration in udder.** Count still high.
Zelda		Quarter rather shrunken, but soft. Milk usually normal appearance.	No change in udder. Milk sometimes giving deposit.

fusion. The treatment was apparently without result, as the case ran a normal course, subsiding to a count of 3 on the seventh day.

Summary

(1) A treatment for mastitis devised by Mr. J. H. Bishop and consisting of the infusion of an affected quarter with air pumped through a very dilute solution of aether has been critically tested under carefully controlled conditions.

(2) The results in all cases were completely negative.

(3) This treatment cannot be recommended either alone or as an adjunct to any other form of treatment.

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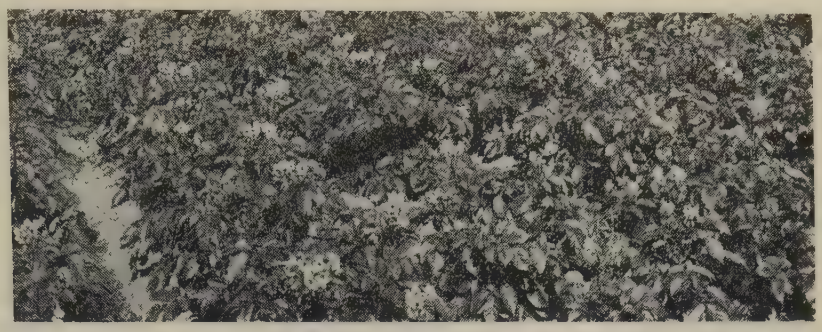
The number of pigs slaughtered for the season 1939-40 at registered premises was 799,759, states the annual report of the Director of the Livestock Division. Those slaughtered on holdings and examined at butchers' shops numbered 19,332, making a total of 819,091, a decrease of 212,696 on last year's figures. Of 771,544 coming under inspection, 134,977 carcasses were found to be affected in varying degree with tuberculosis, the percentage of infection being 17.49 per cent., a decrease of 1.97 per cent. as compared with the previous year. Meat export works, 624,038; abattoirs, 147,506; ordinary slaughterhouses, 28,215; shops, 19,332; total, 819,091.

Potato Crops on Small Areas



A typical example of the results to be expected from using certified seed, showing strong vigorous growth and freedom from weak plants and "misses." Weed growth also has been controlled by the growth of foliage.
J. H. Claridge, Photo.

Directions for Cultivation, Manuring, Planting and Harvesting

— By —
F. SYDENHAM,
Assistant Horticulturist, Wellington.

IT is not surprising, with the potato forming such an important part of our diet, that so many gardeners apportion some part of their vegetable allotment to the growing of this crop. The crop fits in admirably with most gardening practices, and is not difficult to grow. It is good practice to plant at least a quarter of the vegetable garden in potatoes. It is an exhausting crop, and for this reason two potato crops should not follow one another on the same area; nor should potatoes be grown after an exhausting crop such as cabbages.

When a new piece of land is taken into cultivation, potatoes may, with advantage, be the first crop grown. The generous cultivation given during the growing period cleans the ground of weeds and conditions it for subsequent planting. Besides this, the accumulated fertility of the pasture or scrub-covered land is beneficial to the development of the potato crop.

Preparation Of the Soil

While potatoes do best on well-drained, fertile, loam soils, the small allotment gardener must of necessity make the best use of the land he has. Varieties have been evolved which will suit most classes of soil, provided the soil has been suitably prepared. For the early planting of potatoes a light, friable soil is the most suitable.

If heavy, the land should be ploughed or dug in the autumn or early winter and left exposed to the action of the winter weather to mellow it. In the spring it should be cultivated deeply before planting. With light soil which has already been in use for cropping, a deep cultivation several weeks before planting is all that is necessary.

It is not essential to break the soil down to the same extent for potatoes as it is for many other crops. The surface may be left somewhat rough, as pieces of turf and clods will soon be broken down in the course of the cultivation which the crop receives after planting.

Manures and Manuring

On most soils the humus content may with advantage be increased. This may be accomplished by applying farm manure, compost, or by digging under a cover crop. Where the soil is very fertile additional humus should be added with caution, as too fertile conditions produce soft growth, which favours the development of late blight.

The quantity of artificial manure which should be used varies with the

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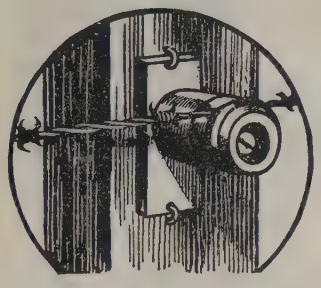

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fertility of the soil. The most suitable dressing consists of 3 parts of superphosphate and 1 part of sulphate of ammonia, applied at the rates of 4 to 5 cwt. per acre on light land and 6 to 7 cwt. on heavy land.

The use of sulphate of potash has not always shown an increase in production. It may, however, be used with advantage on light soils and on those that show a definite response to potash. One cwt. per acre is generally sufficient.

On certain soils, and contrary to general belief, it may be advisable to apply lime. On very sour, peaty soils lime should be used, and on these, in addition to phosphate, 2 to 3 cwt. of potash should be applied to the acre. Scabby tubers will not be produced, providing the addition of lime is made several months before planting and is thoroughly mixed with the soil.

Note: 2½ cwt. of manure to the acre is approximately equivalent to 1 oz. to the square yard, or 1 lb. to 60 ft. of row 30 ins. apart.

The Seed

The New Zealand grower is in the fortunate position of being able to obtain Government certified seed which is true to name and reasonably free from virus and other tuber-borne disease.

The most suitable size of seed tuber is that weighing 2 to 3 oz. Whole seed is the safest to plant, but large tubers may be cut, provided each piece contains at least three strong "eyes" and is of a suitable size. Certain varieties, notably Aucklander Short Top (Sutton's Supreme) and Majestic, will not stand cutting. As a precaution with cut seed the danger of loss is lessened if the sets are planted immediately or precautions taken so that the cut surface is not allowed to dry out.

One chain of row with the tubers set 15 inches apart requires 7 to 10 lb. of seed. For an acre 20 to 30 cwt. are required.

Sprouting Seed for the Early Crop: The use of sprouted seed ensures an earlier and more vigorous crop. Set the tubers side by side, the rose end upwards, in shallow trays in a light airy shed. If this is done six to eight weeks before planting time, short thick sprouts will have developed by the time the seed is planted. Every care should be taken not to damage these sprouts at planting time.

Planting

It is general to plant in rows 27 to 30 inches apart, and to space the sets at intervals of 12 to 18 inches. A covering of 3 to 4 inches of soil over the tuber should be sufficient.

The most satisfactory method of planting is to set the tubers in furrows made during the final preparation of the land. Along the bottom of these the fertiliser should be distributed and mixed with the soil. This mixing is

that these wools secured values comparable in every way with the crossbred wool.

BRITAIN WANTS ALL OUR WOOL

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[From Our Parliamentary Reporter.]

WELLINGTON, July 31.

Summarising the wool agreement, the Minister of Finance, Mr Nash, pointed out that the price agreed upon, 12¼d a pound, was one-third higher than the average of the preceding season. . . .

As for the future, the Minister stated:

"The United Kingdom Government requires all the wool that New Zealand can produce, and, indeed, has already contracted to purchase the entire clip for the duration of the war and one year thereafter."—Evening Star.

This is the clear-cut call that sheep farmers have awaited for months. Thousands are responding. Hundreds are meeting increased wages, rising costs, and mounting taxation; are getting higher money returns through increased carrying capacity—more fat lambs and greater wool per animal—through top-dressing. Also see article at right.

15,000 TONS MORE CHEESE

GREATLY INCREASED SUPPLIES OF BACON

Dairy Board in Charge of Mother Country's Urgent Request

With Denmark under the German heel, Britain has been deprived of an important source of butter, cheese, bacon, and pork. The Dairy Board appeals to you to help replace part of this lost supply. Answering the question as to how best every farmer can assist, the July "Exporter" said: "It is obvious that the number of dairy cows in milk cannot be suddenly increased; the building up process is necessarily gradual. So increased production must come mainly from the farms which are already producing. The lower the production of butter-fat per acre on individual farms, the greater the potentialities.

"Broadly speaking, production can be most quickly increased by better feeding of stock. In turn, **that means the making of more ensilage and hay this summer.**

"You help your herd, your own position, and your country when you make more ensilage this season."

To do this you'll need

More Top-dressing

And you can do it without extra labour with a Munro "Triumph" Top-dresser. Only a small money outlay needed to secure certain and greatly increased returns.

Speeding up production with the aid of the Munro "Triumph" Top-dresser. Attached to any wheeled vehicle its full forced feed enables it to mix any two ingredients and spread perfectly in any ratio from 1 to 1 up to 1 to 20.

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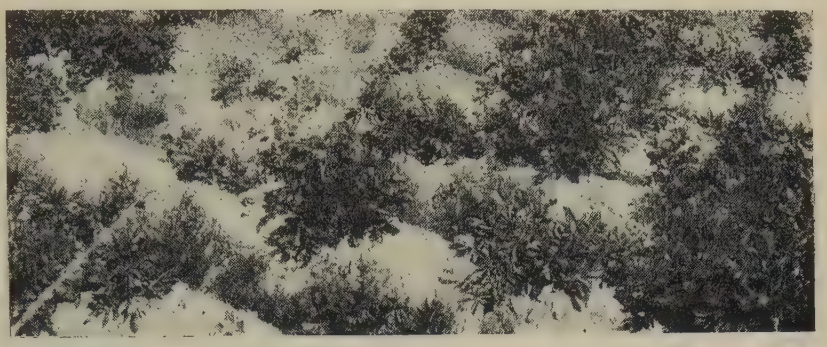
W. E. Lewisham Ltd., Anzac Avenue, Auckland. Wellington: N.Z. Farmers' Co-op. Distributing Co. Ltd., Feilding and branches. Taranaki: Farmers' Co-op. Organisation Society, Hawera and branches. Hawke's Bay: G. M. Spencer, Hastings. Canterbury: Skilling's Implements, Christchurch and Rangiora. Westland: Dalgety & Co. Ltd., Greymouth. Nelson: Dalgety & Co. Ltd., Nelson. Marlborough: Wright, Stephenson & Co. Ltd., Blenheim.

J.A.11

especially important where cut seed is used. The sets should be placed with the rose end facing upwards.

The main crop should be planted as soon as the soil has warmed sufficiently to promote good growth. If the crop is planted early it should suffer less from summer drought and late blight. Where the young plants are nipped by an unseasonable frost, it is not likely that serious damage will result. The end of September and early October is a suitable time to plant in most districts.

The early crop grown in districts free of frost may be planted in May. In other districts planting may be done as soon as the soil is in workable condition, from the end of July to the end of August. As the early crop is dug before it reaches maturity, 2 ft. between the rows and 12 inches between the sets is sufficient.



An extreme result from the use of uncertified seed, showing the effects of using seed potatoes badly infected with virus diseases. Note the large proportion of blanks and weak plants and the resultant development of weed growth.

J. H. Claridge, Photo.

Cultivation After Planting

Frequent and thorough cultivation is required after planting. The first cultivation, if shallow, may be made after seedling weeds appear and before the crop shows above ground. When the shoots appear the cultivation between the rows may be deep in the early stages, but shallower later. As the crop develops, a little soil should be worked towards the plants with each cultivation. By this means the crop is moulded gradually. This ensures that the underground stems will be covered with soil. At the same time many small weeds will be buried.

The final moulding should be completed when the plants are developing rapidly and the foliage will keep most weeds in check. With efficient moulding the greening of tubers is eliminated and they are protected against potato moth.

It is important that the crop should be earthed up as high as possible. In the final operation the soil should be brought from both sides of the row to form an inverted V with the plant

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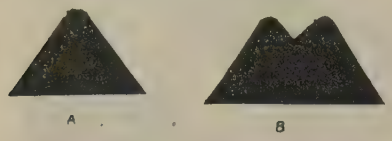
growing out of the apex. Moulding to produce an M should be avoided, as by this method the spores of late



A: The correct method of earthing up potatoes. B: The incorrect way.

blight may be washed down to the tubers.

Harvesting

The early crop may be dug as soon as the tubers are large enough to use. Only sufficient for immediate requirements should be dug at one time, the remainder being left undisturbed to continue growth.

The main crop is ready to dig when the skin of the potatoes is firm and will not rub off freely. In warm moist districts where re-growth is likely the crop should be dug promptly on reaching maturity.

The tubers should be left on the ground only until they dry off. If too long exposed to the sun there is a danger of greening or sun scald occurring. At the time of digging all tubers should be removed from the ground.

Storage

The essential conditions of a store are that it be cool, clean, and well ventilated. It should also be dark to avoid greening of the tubers. The tubers should not be stored where the direct rays of the sun can strike them through a window. The crop may be stored in clean sacks, bins, or boxes.

As with other stored crops, the tubers should be gone over occasionly, and any showing signs of decay removed. If the stored crop is well ventilated few sprouts should be produced later in the season.

Varieties

There are a great number of varieties of potatoes, many of which are suited to particular conditions of soil and climate. As a general recommendation, however, and regardless of soil and climatic variations, the amateur grower might well be advised to grow two varieties. These are Arran Banner as the early crop and Aucklander Short Top (Sutton's Supreme) as the main crop. Only a few rows of the former should be grown, as the tubers are best used in a partially immature condition, and lose in quality as they ripen.

The following list of varieties is given for those who desire to vary from this general recommendation.

(*a*) *Early Crop*:

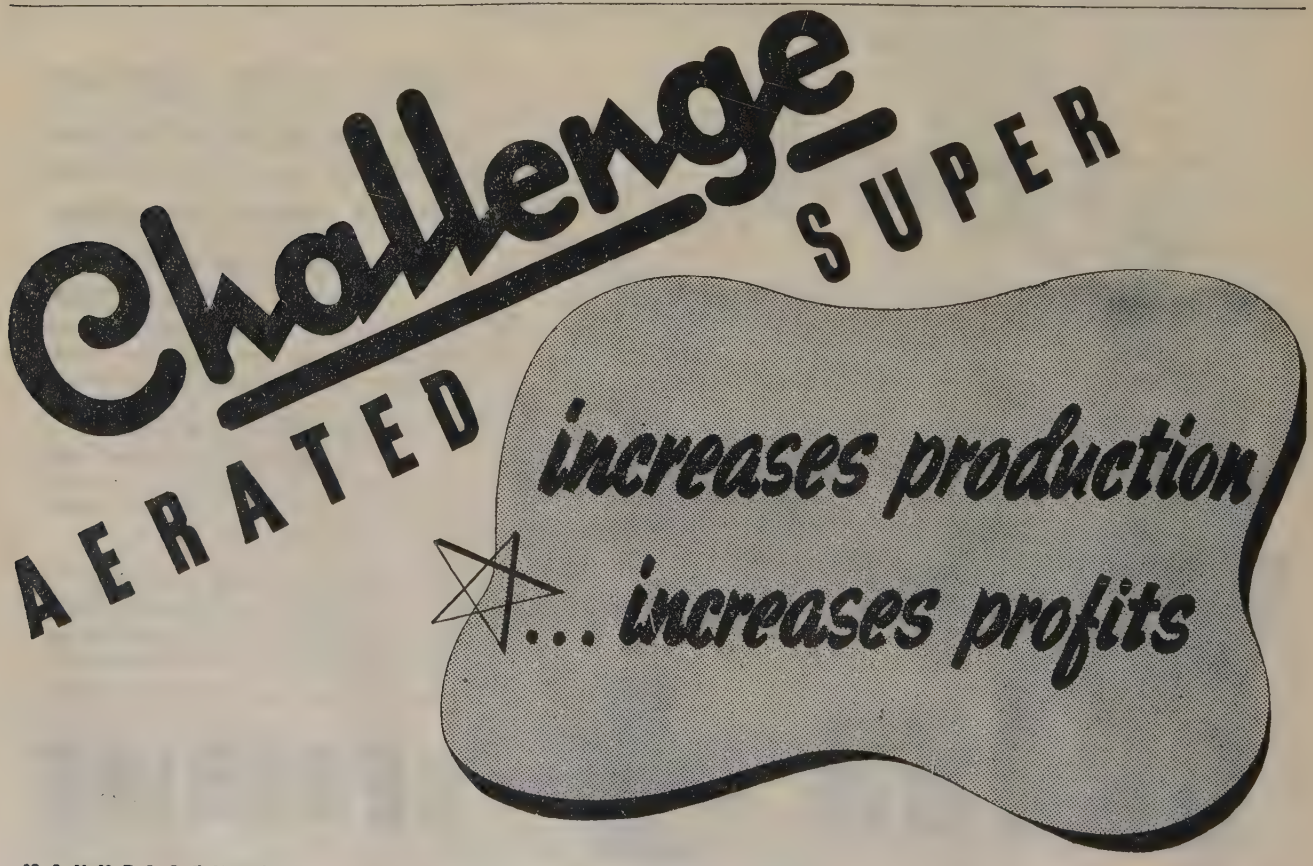
Arran Banner, Early Rose, Epicure, Jersey Bennes (suited to a moist, cool climate such as Southland and Otago), and Cliff's Kidney.

(*b*) *Main Crop*:

Light Soil.—Aucklander Short Top and Dakota (in dry, blight-free areas).

Medium Soil.—Aucklander Short Top, Majestic, Dakota (in dry, blight-free areas), King Edward VII (moist, cool climate such as Southland and Otago), and Up-to-date.

Heavy Soil and Peat.—Aucklander Short Top, Majestic, Arran Chief,



Inverness Favourite (try in preference to Arran Chief), and Iron Duke.

Diseases

Disease in potatoes is an important factor in reducing both the productivity of a crop and the keeping quality of the tubers. Control measures are recommended to be instituted before the disease appears, or when it is present in its earliest stages. Those which are tuber-borne are reduced if clean "seed" is planted, and the crop is grown on ground on which the potato crop has not been grown for several years.

The mechanical condition and the fertility of the ground are also of importance. Where the condition of the soil is such that it does not permit the development of healthy and vigorous plants, the incidence of disease is likely to be greater. Where the soil is too fertile, a soft sappy growth which offers little resistance to invasion by fungous spores is produced.

The following is a brief account of the two main potato diseases and their control:—

(1) *Virus Diseases*: There are a number of virus diseases affecting potatoes. These are described under various names, such as "leaf-roll," "mosaic," "spindle sprout," etc. They all have the effect of retarding the development of the plant, and as a result the tubers produced, while they may be plentiful, are small in size. The produce, while small, is quite suitable for culinary purposes, but the yield is low. The disease may be present in the seed tuber or it may infect the plant during the growing season. There is no known means of combating the different virus diseases once they are established in a stock, as tubers from a diseased plant are always infected. The grower, however, is able to purchase certified seed which, in addition to other qualities, is practically free of virus.

(2) *Late Blight*: This blight is caused by the fungus *Phytophthora infestans*. The disease appears as darkened patches on the leaves. On the lower surface of the leaf a white downy-like mildew may be seen with the naked eye. Under warm humid conditions these areas extend rapidly, and both leaves and stems may soon become infected. The fungus does not penetrate through the plant to the tubers. These latter, however, may be infected by spores washed from the aerial parts of the plant. If the crop is efficiently moulded so that one ridge is formed, and not two with a furrow between, there should be less likelihood of tuber infection. Where the infection is severe the tops should be removed and burnt. After this operation the tubers may be left in the ground for several weeks to harden and mature before digging.

Control measures should be taken early. The crop should be sprayed with Bordeaux mixture at a strength of 3-4-50 when the plants are 6-8 inches high, and the spraying repeated at two- to four-week intervals so that the whole plant, as it develops, may be covered with the spray. In wet seasons it is frequently an advantage to increase the strength of the Bordeaux mixture to 5-4-50. This strength of spray increases the amount of the mixture on the plant, and at the same time hardens the plant tissues and checks their development.

Preparation of Bordeaux Mixture

The strength at which to apply Bordeaux mixture in control of potato blight is 3-4-50—that is, 3 lb. of copper sulphate (bluestone), 4 lb. freshly-hydrated lime, and 50 gallons of water.

For the preparation of 4 gallons of Bordeaux mixture at this strength use 4 oz. of copper sulphate and 5 oz. of hydrated lime.

The following procedure should be closely followed when preparing 4 gallons of 3-4-50 Bordeaux mixture:—

(1) Dissolve 4 oz. copper sulphate in about a gallon of water in a wooden, earthenware, glass, or copper container.

(2) Add water to 5 oz. of fresh hydrated lime till it assumes the consistency of thick paste. Then dilute it with about a gallon of water.

(3) The lime solution should now be poured into the copper sulphate solution (or vice versa), stirring vigorously while so doing, and while the stirring continues make the volume up to 4 gallons.

The spray is then ready for use, and should be used immediately. When the crop requires a further spraying a fresh mixture should be prepared.

Where 4 gallons of 5-4-50 Bordeaux mixture are required, use 6 oz. copper sulphate and 5 oz. of hydrated lime, and proceed as above.

Acknowledgment

The assistance given by Messrs. J. H. Claridge, Seed Certification Officer, and J. O. Wallace, Fields Instructor, both of the Fields Division, in the preparation of this article is appreciated.

Note: Growers who require further information on potato-growing are advised to refer to Bulletin No. 142 entitled "Potato-growing in New Zealand."

Registered Nurseries

CLOSE attention has been given to the inspection of nurseries in which prescribed plants, as set out in the regulations relating to the registration of nurseries, are raised for sale, states the annual report of the Director of the Horticulture Division.

Reports to hand indicate that the majority of the nurseries in the Dominion are kept in good order and condition, and the stock raised is well up to standard and free from disease. In any instances where it has been found that disease exists steps have immediately been taken for its control.

Nurserymen experienced a somewhat difficult season in the raising of plants, owing to continued wet conditions in the spring, and this also had the effect of the public holding off buying plants until the conditions improved.

A total of 582 nurseries located in different parts of the Dominion were registered during the year ended March 31 last, and certificates of registration issued, the registration fees amounting to £582. This shows an additional 48 nurseries as compared with the number registered last year.

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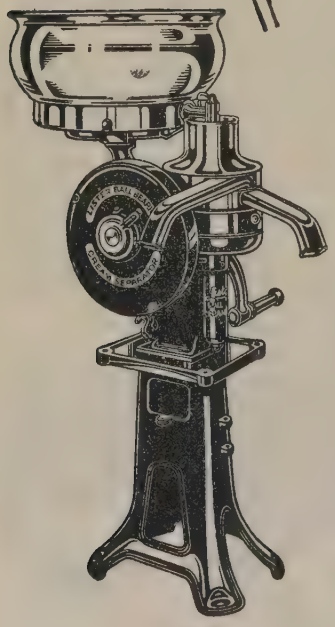

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Experiments in the Te Puke district last season have proved that cress taint can definitely be overcome by controlled grazing.

Cress Taint Can Be Overcome!

Although a certain amount of additional work is involved, the difference in payout will more than compensate for the extra trouble.

By

A. V. ALLO,
Instructor in Agriculture,
Tauranga.

MUCH concern has been caused in the Tauranga, Kati Kati and Te Puke districts during the past few years through the tainting of cream by certain plants which may be eaten by cows during their grazing. The most serious trouble is undoubtedly given by twin cress (*Coronopus didymus*), which is also known as land cress or hog cress.

This weed is an annual, with trailing stems, very finely divided leaves, and small clustered, white flowers that are scarcely visible. It appears in the early spring, and in a normal season may last until after Christmas.

As it is an annual, making its growth at a time when the normal species in a pasture are starting to make their main growth, it does not usually cause a great deal of concern in a pasture containing a dense sole of ryegrass or clover. It is in a thin, weak sward that the weed tends to show up at its worst.

Spread of Cress

Factors contributing to the spread of cress are:—

(a) Heavy stocking and tramping of a pasture during winter, with consequent overgrazing and pugging, leading to a thinning of the sward.

(b) Grass grub attack, which weakens a sward and leaves bare places for the weed to develop.

(c) Leaving old stack bottoms and ensilage pits unfenced from stock. Cress tends to grow freely in such places, and can cause a great deal of trouble even though the patch may be but small in area.

(d) The heavy trampling around gateways, which are often but bogs in the winter, give rise to conditions eminently suitable for cress development.

(e) The bare patches of ground around stock yards and cowsheds also offer favourable conditions for cress to establish, as does the bare ground under a hedge.

(f) Paddocks that are lying uncultivated after a crop such as maize usually have a high cress population in the spring.

This is what causes the trouble—twin cress (*Coronopus didymus*).

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(g) The sowing of pastures in the spring, particularly after a crop of maize, often gives rise to conditions suiting cress. In one spring-sown pasture the writer counted 502 cress plants in one square yard of the paddock, and the average of 24 counts was 106 plants. Thus, it is quite obvious that cows grazing on such a paddock could not help eating a quantity of cress.

During the past few seasons the Fields Division, in conjunction with the Dairy Research Institute, has been investigating the position, and as a result of field trials not only in the Bay of Plenty but also in the Waikato and Manawatu, one is able to give recommendations that will help to overcome a great deal of the trouble.

Effects on Milk

Before describing control measures, it may be of advantage to give some account of the effects of cress on the milk, and consequently on the cream It has been found that the average cow will produce cress-tainted milk about 20 to 30 minutes after the cress has been eaten, although the time taken for the cress to show up in the milk after being eaten varies according to the individual cow. It has also been found that some cows will give a stronger taint than others fed on a similar quantity of cress. The amount of cress that must be eaten before a taint is given to the milk is very small, and tainted milk from but one cow may contaminate all the rest of the milk from the herd, even though the remaining cows have eaten no cress.

Tainted milk and cream has a characteristic taste and odour. It is rather harsh to the palate, and leaves a hot taste in the mouth, rather similar to the flavour of very mild mustard. Warm cream or milk will show a taint more readily than cool or cold material. When tainted cream is heated a characteristic "mustard" smell is given off.

Quite often, cream may be so slightly affected that the taint cannot be detected in the cold cream, which may be mixed in the vats with perfectly clean cream. While the cream is cold no taint is noticed, but once the cream has been processed before churning, the heating the cream receives is quite sufficient to spread the taint through the whole vat, with consequent detrimental effects on the butter. This is one of the chief explanations of why a factory may sometimes grade 60 per cent. finest cream and yet make only 30 to 40 per cent. finest butter.

The cress problem is therefore very serious, and causes farmers in the affected districts serious loss each year, particularly in a season when cress is plentiful.

Control Measures

Fortunately, there is a solution, for it has been found that the average animal can expel the cress from its system in three to four hours after the cress has been eaten. Control measures are therefore based on this knowledge. If cows grazing on a cressy paddock are removed to a cress-free paddock at midday, there should be little or no cress taint in the cream that night. If no cress-free paddock

is available—that is, if all the paddocks on a farm are infested with cress—they should be put into a holding yard in which there is no cress.

In the latter case, many farmers may object to taking their cows off pasture at noon and leaving them yarded up for four hours, but investigation has shown that, provided there is ample feed for the cows available in the morning, there will be little or no drop in production when the cows are held in the yard.

Results of Trials

Experiments carried out in the Te Puke district last season have established that if controlled grazing as advocated above is practised, cress taint can definitely be overcome. Two trials were established, in which cows were grazed on cressy fields all day and next day were grazed on cressy fields until noon and were yarded in a cress-free yard until milking.

These trials definitely established that by controlled grazing the taint could be overcome. Admittedly, it may at times be a nuisance having to shift the cows at midday, but when one considers the difference in payout for finest and second-grade cream, plus the fact that a factory manager may reject badly tainted cream, it would appear that the slight amount of trouble is well worth while.

The results obtained in these experiments have been verified by the experience of many farmers who have effected considerable improvement in their grading by practising controlled grazing. A number of farmers who had trouble with cress taint last season were able to overcome the trouble once they adopted the measures advocated.

In conclusion, thanks are due to those farmers and dairy companies who have co-operated with the Department in these investigations, and whose enthusiasm has been such a help in tackling this serious trouble.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the four months, May-August, 1940, have been compiled by the Livestock Division:—

District	Catttle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat Export Slaughterhouses—						
Auckland	86,530	331,068	60,080	37,499	102,987	62,040
Poverty Bay - Hawkes Bay	41,477	29,171	115,653	50,451	127,289	7,643
Taranaki-Manawatu ..	52,795	124,172	65,496	40,602	138,490	39,563
Wairarapa-Wellington ..	25,404	17,005	51,081	27,664	89,620	8,137
Totals	206,206	501,416	292,310	156,216	458,386	117,383
Abattoirs	45,193	15,720	160,711	81,240	12,304	33,445
North Island Totals ..	251,399	517,136	453,021	237,456	470,690	150,828
South Island						
Meat Export Slaughterhouses—						
Nelson-Marlborough ..						
Canterbury	1,223	2,574	26,552	12,276	51,359	2,649
Otago-Southland	5,368	10,474	218,578	179,204	321,937	8,022
	6,101	1,782	156,759	131,518	587,740	2,114
Totals	12,692	14,830	401,889	322,998	961,036	12,785
Abattoirs	19,776	4,514	89,398	44,821	7,509	13,073
South Island Totals ..	32,468	19,344	491,287	367,819	968,545	25,858
Dominion						
Meat-expt. Slaughterhouses	218,898	516,246	694,199	479,214	1,419,422	130,168
Abattoirs	64,969	20,234	250,109	126,061	19,813	46,518
Grand Totals	283,867	536,480	944,308	605,275	1,439,235	176,686
Same Period, 1939— Meat Export Slaughterhouses and Abattoirs ..	221,226	534,095	678,554	362,642	1,496,955	129,954
Same Period, 1938— Meat Export Slaughterhouses and Abattoirs ..	197,807	532,120	794,514	469,476	1,328,228	185,132

Slaughterings of Pigs

The 19,453 pigs killed during August were distributed in weight ranges as follows:—

Under 60 lb.	38
60-100 lb.	5,761
101-120	1,941
121-160 lb.	3,028
161-180 lb.	1,047
Over 180 lb.	478
Sundries	7,160

The grading of pork is 87 per cent. primes and 13 per cent. second quality; and of bacon, 74 per cent., 20 per cent. and 6 per cent. of prime 1's, prime 2's, and second quality respectively.

In different weight ranges of baconers the grading is as follows:—

101-120 lb.	80%, 14%, 6% of P1, P2 and seconds.
121-160 lb.	73%, 21%, 6% of P1, P2 and seconds.
161-180 lb.	68%, 23%, 9% of P1, P2 and seconds.

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Pedigree Sow Records

Contributed by the LIVESTOCK DIVISION.

OF the 61 sows recorded for the quarter ended August 31, 1940, 44 had litters sufficiently good to be included in one of the five grades set out below:—

Grade.	Litter Weight.	
	At 3 Weeks.	At 8 Weeks.
1	120 lb.	360 lb.
2	100 lb.	300 lb.
3	90 lb.	270 lb.
4	80 lb.	240 lb.
5	70 lb.	210 lb.

THE following table sets out the performance of each breed as an average for all sows recorded during the quarter:—

Averages.

Breed.	No. of Sows.	No. of Pigs per Litter.		Litter Weight at		Weight per Piglet	
		Born.	Weaned.	3 weeks.	8 weeks.	3 weeks.	8 weeks.
Berkshire ..	26	9.4	7.7	91.0	259.5	11.9	33.9
Large Black ..	6	12.3	8.8	97.7	281.2	11.0	31.8
Large White ..	4	9.5	8.8	94.8	300.8	10.8	34.4
Tamworth ..	25	9.6	7.3	80.3	253.4	11.0	34.6

In the following list the owner's name and address are given, followed by the herd book numbers of the sire and sow, the weights at three and eight weeks, the number of pigs born and weaned, and the grade of the litter.

Berkshires.

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs		
	Sire.	Dam.	3 weeks.	8 weeks.	Born	Weaned.	Grade of Litter
Burmeister, O. P., Kairanga R.D., Palmerston North ..	12859	11671	89	246	9	7	4
Burmeister, O. P., Kairanga R.D., Palmerston North ..	12859	13989	91	264	7	7	4
Dron, W. D., Hope R.M.D., Richmond, Nelson ..	15328	14465	90	326	11	8	3
Dron, W. D., Hope R.M.D., Richmond, Nelson ..	15328	15348	96	227	15	10	5
Dron, W. D., Hope R.M.D., Richmond, Nelson ..	15328	12322	110	361	13	8	2
Dron, W. D., Hope R.M.D., Richmond, Nelson ..	15328	14181	85	263	12	8	4
Ellerm, O. C., Sanson R.D., Palmerston North ..	15328	11184	80	261	9	7	4
Hicks Bay Pig Club, c/o. L. T. Hughes, Hicks Bay ..	14949	12708	143	399	13	10	1
Hooper, A. W., Dalefield, Carterton	14860	12622	86	232	6	6	5
Hunua Pig Club, c/o. A. M. Stewart, Hunua	14832	14029	74	229	5	5	5
Kaimoe Pig Club, c/o. L. Munro, Patutahi	14602	14447	85	187	8	7	—
MacIndoe, C. G., Te Matai Road, Te Puke	12248	13529	93	318	8	8	3
MacIndoe, C. G., Te Matai Road, Te Puke	14951	13517	79	234	9	5	5
Magner, C. A., Te Kowhai, Frankton	14951	12372	118	332	8	8	2
Manutuke Pig Club, c/o. R. K. Hepburn, Manutuke ..	15481	15650	70	187	9	9	—
O'Connell, Dave, Box 14, Manutuke	13858	13606	108	255	10	8	4
Ohau Pig Club, c/o. W. R. B. Evans, Buller Road, Levin	14391	11817	96	275	10	9	3
Ororu Pig Club, c/o. Tui Packard, Taipa	15361	13207	76	143	8	5	—
Rotomanu Pig Club, c/o. H. E. Hodgkinsen, Rotomanu, Westland	13405	14196	74	205	8	8	—
Ruatoki Pig Club, c/o. D. P. Hawiki, Ruatoki North, Whakatane	14690	12798	109	320	11	9	2
Ruatoria Pig Club, c/o. C. Wilson, Ruatoria	13024	12550	109	292	10	8	3
Takaka Pig Club, c/o. W. J. E. Jenkins, Box 28, Takaka	13156	14454	83	241	9	7	4
Te Kowhai Pig Club, c/o. A. R. Gifford, Te Kowhai R.D., Frankton	13544	12878	94	242	7	7	4
Tikapa Pig Club, c/o. D. Swann, Tikitiki	12949	12939	98	295	10	10	3
Whakatohea Pig Club, c/o. Fred Amoamo, Lower Waiaua, Opotiki	15939	16099	69	175	9	7	—
	13595	13877	85	239	10	8	5

Large Blacks.

Liggins, J. H. P., Box 6, Tokomaru	2377	1849	150	416	16	11	1
Pio Pio Pig Club, c/o. G. C. Sheffield, Pio Pio ..	Tamworth						
Pukekawa Pig Club, c/o. J. L. Lindberg, Pukekawa R.D.	9135	1738	88	347	11	8	4
Rangiriri Pig Club, c/o. C. R. McCutchan, Rangiriri	1861	1026	72	250	13	8	5
Tahuna Pig Club, c/o. F. B. Whitechurch P.B., Morrinsville	2447	1739	129	307	10	10	2
Turner, C. F., P.O. Box 181, Rotorua	1275	1721	81	186	8	8	—
	2271	2405	66	181	10	8	—

Large Whites

Keiller, B. E., P.O. Box 272, Palmerston North ..	5108	4938	105	344	9	9	2
Magner, C. A., Te Kowhai R.D., Frankton Jn. ..	5272	5264	96	229	10	9	5
Mortensen, H. C., Mauriceville West	5266	5271	94	402	12	11	3
Rowlands, T., Ruthin R.M.D., Kaiapoi	4548	4814	84	228	7	6	5

Tamworths.

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs.		
	Sire.	Dam.	3 weeks.	8 weeks.	Born.	Weaned.	Grade of Litter.
Ararimu Pig Club, c/o. I. L. Chamberlain, Ararimu ..	11202	10885	91	290	7	7	3
Coromandel Pig Club, c/o. K. A. McNiel, Coromandel	11591	10732	83	272	8	7	4
Deck, G. M., R.D. Upper Moutere	10106	10107	113	315	11	10	2
Grooby, L. H., Umukuri R.M.D., Motueka	11870	11050	73	227	6	6	5
Hamilton, C. J., Manutuke	11358	10009	138	403	12	11	1
Hudson, R. J., Mitcham, Mid-Canterbury	7486	11460	124	351	13	12	2
Hunua Pig Club, c/o. A. M. Stewart, Hunua	11536	11159	88	251	9	8	4
Knight, R., Westmere, Wanganui	10498	10745	91	305	15	9	3
Kokotahi-Koiterangi Pig Club, c/o. F. C. Marshall, Kokotahi R.D., Hokitika	10316	10294	57	157	10	5	—
Linton Pig Club, c/o. E. H. Bowler, Linton	11024	9747	64	160	11	6	—
Motukarara Pig Club, c/o. T. M. Wheeler, Motukarara	11172	9854	81	290	9	8	4
Moutere Pig Club, c/o. G. Deck, R.M.D. Upper Moutere	10106	11306	106	297	10	8	3
Munro, K. R., P.O. Box 3, Pokeno	11202	11292	130	414	8	8	1
Ohau Pig Club, c/o. W. R. B. Evans, Levin	10659	9745	46	125	8	3	—
Pio Pio Pig Club, c/o. G. C. Sheffield, Pio Pio ..	9135	11224	50	170	7	5	—
Pohangina Pig Club, c/o. T. J. Spelman, Raumai ..	8774	10142	53	216	9	5	—
Pukekawa Pig Club, c/o. J. L. Lindberg, Pukekawa ..	4723	10055	63	212	7	6	—
Suter, E. A., Waiau Pa	10688	10938	86	355	10	10	4
Suter, E. A., Waiau Pa	9430	9030	82	269	11	8	4
Suter, E. A., Waiau Pa	9430	11304	106	319	13	10	2
Suter, E. A., Waiau Pa	9430	4450	67	217	6	6	—
Te Kaha Pig Club, c/o. T. August, Te Kaha	10220	10737	57	189	8	4	—
Waihi Pig Club, c/o. A. C. Davidson, Waihi	5830	10733	48	151	12	5	—
Waioeka Pig Club, c/o. A. Nicol, Waioeka, Opotiki ..	10220	10987	79	239	10	10	5
Waiuku Pig Club, c/o. Wm. S. Morrin, Waiuku ..	11202	9920	54	140	9	6	—

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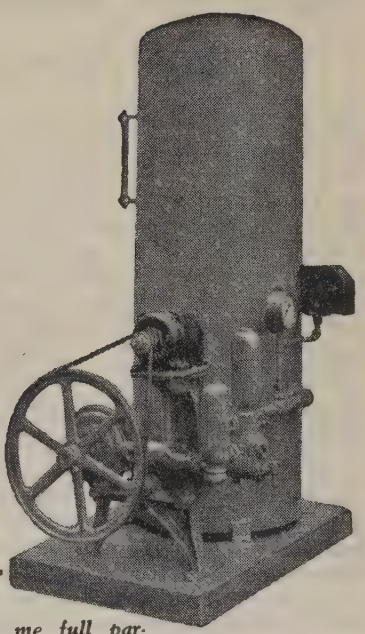

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Carpet Beetles Damage Your Clothes

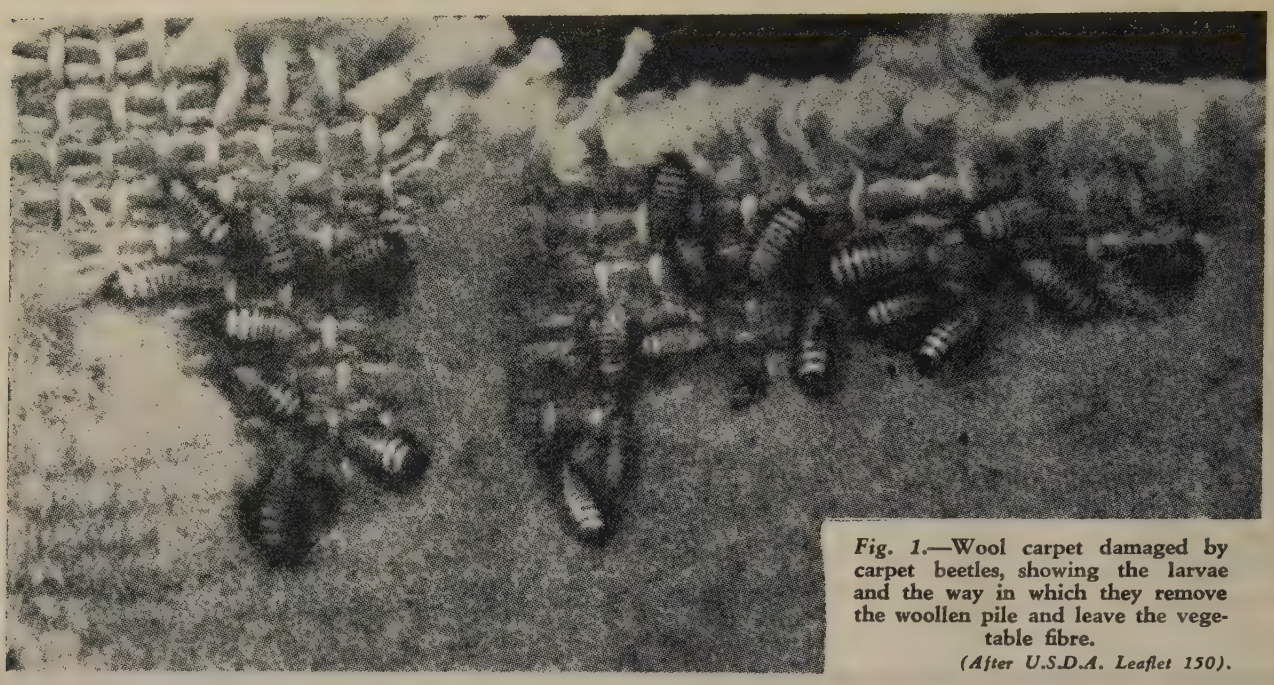

Fig. 1.—Wool carpet damaged by carpet beetles, showing the larvae and the way in which they remove the woollen pile and leave the vegetable fibre.
(After U.S.D.A. Leaflet 150).

Here Are Methods Of Eradicating And Controlling The Pest

By L. J. DUMBLETON,
Assistant Entomologist,
Plant Research Bureau, Nelson.

Methods for the control and eradication of the carpet beetle, which is a common pest in New Zealand households, are discussed in this article. This beetle does widespread damage to upholstered furniture, carpets and clothing.

IN New Zealand, as elsewhere, the common pests of clothing, upholstery, and carpets are clothes moths and carpet beetles. The clothes moths will be the subject of another article. It is common for all damage to fabrics to be attributed to clothes moths, although the carpet beetles are widely distributed and common in New Zealand.

In general, the larvae or grubs are the destructive stage of the carpet beetles, and can be distinguished from the corresponding caterpillar stage of the clothes moths by the brown banding and dense hairiness of the beetle grubs, and the fact that they do not spin any webbing on the materials they attack, as do the clothes moth caterpillars. The control measures detailed below for the carpet beetle are equally applicable to the clothes moth.

Varied Carpet Beetle

The varied carpet beetle (*Anthrenus verbasci L.*) is 1-10th of an inch in length and broadly oval in shape, somewhat resembling a small ladybird beetle (Fig. 2). The antennae, or feelers, are short, and are folded in grooves underneath the body when the beetle is disturbed. The general colour is a yellowish brown. There are three patches of white scales on the posterior part of the thorax, one in the centre and one in each posterior angle. Near the base of the wing covers are a number of patches of white scales which form an interrupted band across the body. At mid-length there is a W-shaped band of white scales extending across the body. Behind this there is a patch of white scales on each side The underside of the body is covered with grey or whitish scales.

The adult beetles fly readily, especially towards the light, and are often found on windows. They seem to be attracted to the blossoms of various plants.

The larvae or grubs are up to 3-16ths of an inch in length (Fig. 3). The grubs are fairly stout, that is, short in proportion to their length. They are narrowest at the head end, and widest near the posterior end. The general colour of the dorsal surface is a chestnut brown. The under surface is creamy white.

The body is composed of a number of brown segments, which are separated by narrow bands of white or cream colour. This imparts a characteristic banded appearance to the grubs. The whole of the body is fairly densely covered with long brown hairs. In addition to the hairy nature of the grub, a characteristic feature is the presence on each side of the posterior end of three tufts of bristles

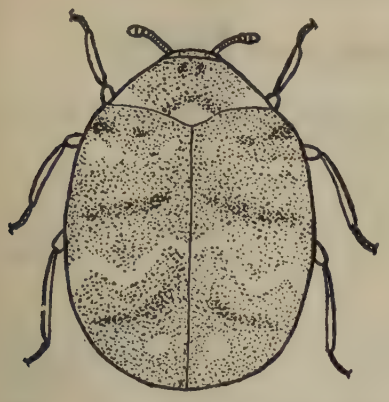

Fig. 2.—**The adult of the varied carpet beetle.**

or scales. When these are at rest the tips of the tufts meet behind the body, giving a characteristic V-shape to the posterior end. When the larva is disturbed the tufts may be elevated and fanned out.

The grubs prefer to be concealed in dark places, such as under the edges of carpets or in undisturbed clothes cupboards. Before the periodic moults the grubs frequently crawl into cracks or under skirting boards and emerge again to feed after the moulting is completed. They feed on a wide range of materials, including wool, hair, feathers, fur, bristles, dead insects, and also on mealy or floury material. When they have fed on anthrax-infested skins they have been proved to be able to disseminate the anthrax bacillus on their bodies and in their excreta.

Grubs Do the Damage

The grub is the only stage of the insect which does any damage to clothing and carpets, etc. It simply eats holes in woollen material or skins, and strips the woollen or hairy material from the carpets (Fig. 1). Inside the skin of the fully-fed grub, the pupa or chrysalis stage forms, and subsequently the skin splits up the back. The remains of the pupal case are left behind inside the skin of the grub, when the adult beetle emerges from the pupa.

The eggs are small and white, and are not normally seen unless they are carefully searched for. The available information indicates that the beetle is present and laying eggs about the middle of November. The beetle may lay 100 eggs, which are deposited on clothing, upholstery, carpets, or in floor cracks and under skirting boards. They hatch in one or two weeks.

The small grubs which hatch from the eggs begin to feed. They feed throughout the summer and autumn and during this period they moult or cast their skins several times. These cast skins are frequently seen under carpets or in clothing cupboards. The evidence indicates that the insect passes the winter in the grub stage, and transforms to the pupa in spring. The insect normally has only one brood in the year, and during most of this time it is in the grub stage. Probably there is very little feeding by the grub during the winter because of the low temperatures which prevail.

Control

The control of this pest may be dealt with under several headings.

(1) The eradication of the insect from an infested house or from upholstered furniture, carpets, or clothing.

In the case of a severe infestation the quickest and most effective method of ridding a house of the pest is to close it up, making it as air-tight as possible and fumigating with calcium cyanide. The use of cyanide gas is not recommended except in cases of extreme infestation, as it is extremely poisonous to human beings and to animals, and its use involves a considerable disturbance in domestic routine. It is essential that it should be used only by someone with previous experience of its use; it certainly should not be used otherwise.

If the infestation is not sufficiently serious to make the use of fumigation necessary the whole house can be thoroughly cleaned. Carpets should be taken up and thoroughly brushed and vacuum cleaned and a lysol solution or a spray of pyrethrum in kerosene used to treat under the skirting boards and in the floor cracks where the grubs may find harbourage. Trunks and storage cupboards for clothes should be cleaned out in a similar manner.

The kerosene-pyrethrum spray is made by adding ½lb. of pyrethrum powder (obtainable from wholesale chemical firms) to 1 gallon of specially refined water-white kerosene. The mixture is allowed to stand for two hours, during which it is stirred frequently, and the clear yellow liquid is then strained or filtered off. If it is to be used in the house the addition of 3 fluid ounces of methyl salicylate to each gallon imparts a more pleasant odour. This spray is also effective against other insects such as flies.

Fig. 3.—**The larva of the varied carpet beetle.**
(After U.S.D.A. Leaflet 150).

Infested furniture and carpets may usually be treated by placing them in an air-tight room or box and fumigating with cyanide gas which will kill all the insects present.

Clothing and fabrics can be freed of the insect by washing or by subjection to a temperature of 135 deg. F. for three hours.

(2) The protection of stored woollens, etc., which are free from infestation.

The use of flake naphthalene or para-dichloro-benzene crystals in boxes or trunks containing stored clothing or carpets is frequently advocated These materials seem to be useful repellents, and when clean and uninfested material is being stored it is well to spread the crystals between two sheets of thin paper distributed between the stored articles. The crystals should be used at the rate of 1lb. per 10 cubic feet of air space.

These materials do not seem to be effective in killing clothes moth caterpillars or carpet beetle larvae which are already present, but are useful in deterring the moths and beetles from entering the container in which the articles are stored.

(Continued on page 284.)

Half-yearly Fertiliser Returns—1940

THE following returns from January to June, 1940, have been compiled by the Fields Division of the Department of Agriculture from figures furnished by courtesy of the Comptroller of Customs.

Fertiliser.	Origin.	Jan. Tons.	Feb. Tons.	March Tons.	Quarter Tons.	April Tons.	May Tons.	June Tons.	Quarter Tons.	Half-yearly Returns. Tons.
Phosphatic fertilisers—										
Slag	Belgium	..	..	..	..	..	8,460	50	8,510	8,510
Rock	Nauru	4,042	28,227	7,665	39,934	17,755	14,088	50,350	82,193	122,127
	Gilbert & Ellice Is.	..	19,355	1,197	20,552	12,248	8,434	3,242	23,924	44,476
Total		..	..	..	..	..	..	..	..	*166,603
Guano	Seychelles	3,050	5,550	3,250	11,850	96	..	..	96	11,946
	Madagascar	..	..	1,450	1,450	1,750	..	..	1,750	3,200
	New Caledonia	..	1,974	..	1,974	2,838	..	..	2,838	4,812
	United Kingdom	..	..	..	..	..	18	..	18	18
Total		..	..	..	..	..	..	..	..	19,976
North African	Tunisia	..	..	6,515	6,515	12,189	7,100	..	19,289	25,804
Total Phosphatic Fertilisers—		..	..	..	..	..	..	..	..	220,893
Bone dust and bone char	Australia	45	..	126	171	..	..	..	..	171
Potash—										
Sulphate	France	..	..	..	..	20	20	10	50	50
Other	United Kingdom	..	..	..	..	..	258	40	298	298
	France	1,000	..	79	1,079	1,318	2,641	604	4,563	5,642
Total		..	..	..	..	..	..	..	..	5,940
Nitrogenous fertilisers—										
Sulphate of ammonia	United Kingdom	175	1,150	..	1,325	110	648	50	808	2,133
Nitrate of soda	Chile	..	1,350	..	1,350	..	10	191	201	1,551
Total		..	..	..	..	..	..	..	..	3,684
Other Manures—										
	Australia	..	..	4	4	1	..	2	3	7
	India	..	..	..	..	..	1	..	1	1
	United Kingdom	59	35	..	94	21	14	98	133	227
	United States of America	..	..	..	..	..	..	131	131	131
Total		..	..	..	..	..	..	..	..	366
Totals		8,371	57,641	20,286	86,298	48,346	41,692	54,768	144,806	231,104

* This quantity is equivalent to approximately 283,225 tons of superphosphate.

CARPET BEETLES—continued from page 283.

Valuable articles, such as fur coats, can be stored at temperatures below 50 deg. F., which will prevent any damage by the insects.

(3) The moth-proofing of upholstered furniture, carpets, and clothing.

The prevention of damage by clothes moths and carpet beetles has been attacked from another angle with the object of making the woollen fabrics or carpets poisonous or otherwise unsuitable for use as food by the insects. Some of the materials which have proved effective in preventing damage are inorganic chemicals, such as fluorides or silico-fluorides, which are soluble in water. A coating of poisonous material is left on the fibres of the material which has been washed in the solution.

Materials of this type have to be applied again if the garments are washed. Materials such as the derivatives of cinchona alkaloids are usually dissolved in oils and applied as a spray. Certain complex organic chemicals containing phenols, besides being effective against the insects, are less affected by the dry cleaning and washing of the treated fabrics. A number of proprietary moth-proofing materials embodying the chemicals mentioned above are on the market in other countries.

Reference—

Back E.A. 1938—Carpet Beetles (U.S. Department of Agriculture leaflet No. 150.)

Control of Foot Rot

Foot rot continues to give a good deal of trouble to sheep-farmers, particularly in the South Island, states the annual report of the Director of the Livestock Division. This last season was more favourable to sheep in Canterbury and fewer outbreaks were seen. Outbreaks on flat country were noted farther south. The control of foot rot on any farm can be effected if the measures advocated by the Department are put into operation. These measures are fully outlined in the departmental leaflet on the subject.

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Scour in Calves

PROBLEMS in the rearing of calves will arise now that spring is here, and the ills arising from faults in management will become apparent and cause serious loss. The outstanding trouble, both by virtue of its prevalence and its seriousness, is "scour," or diarrhoea, in the young stock, and a brief discussion of the cause and effect of this trouble is contained in this article.

There are a variety of conditions which may cause scour in calves, and several separate factors may operate at the same time. In all cases, however, a common factor is involved—faulty feeding, either in the nature or the quantity of the food. The basic factor which leads to manifestation of the upset is some disturbance in the digestive tract, and the disease can be divided broadly into two conditions, namely, nutritional scours, and bacterial or "white scours."

It is often difficult, or indeed impossible, to differentiate clinically between diarrhoea due solely to improper feeding and diarrhoea of an infectious type, but in the great majority of cases improper feeding and diet is the dominant cause. Once the scouring is established, however, infection may become the chief factor.

Some Causes

Some calves may scour through eating straw or foreign material or from eating coarse hay at too early an age, and, once started, this may be difficult to control, because the foreign material remains in the stomach for a long time. Scouring may even be induced by changing too early from colostral milk (first milk) to the milk of the herd, that is, before the fourth or fifth day. This latter scour is more or less transient, and, provided infection does not become established, will clear up under treatment within a few days.

The most prevalent cause, however, is the feeding of an excess quantity of milk at each meal, and it is the common factor involved in causing the so-called nutritional scour. Under the normal conditions a calf suckles at numerous occasions during the day, and the quantity taken each time is small. When the calf is pail-fed, however, the number of times of feeding is greatly reduced to three, or even two, feeds per day.

Excess Feeding

The result, if the quantity of food allowed is excessive, is obvious. Being hungry, the calf drinks to excess, with the result that a hard, indigestible curd is produced in the stomach and so irritates the stomach lining that it leads to inflammation and increased activity of the intestine. The food is then forced through the intestinal canal at such a rapid rate that no absorption of food can occur. Outwardly, the disease is indicated by the diarrhoea, with thin, watery, foetid droppings, by the general depression, fever, thirst, and lack of appetite. Inwardly the effects revolve upon the inability of the calf to absorb nutriment and the

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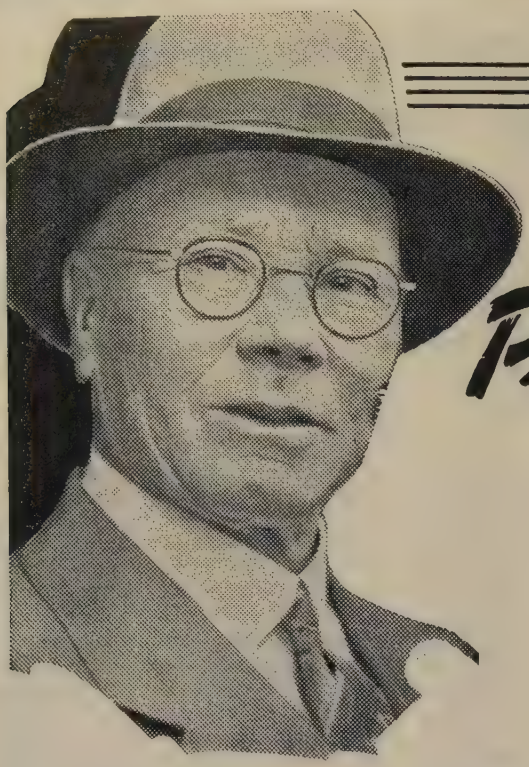

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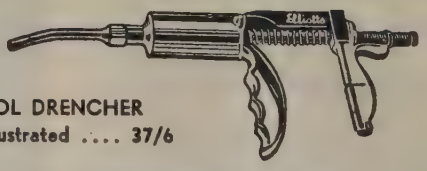

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feverish condition induced by the bowel inflammation.

This condition is most likely to occur in calves from a few days old up to approximately three weeks, but it must be remembered that carefully controlled and systematic feeding is essential much longer than this period, as faulty diet can also give rise to digestive disturbance in older calves.

Vital Factor

"White scours," "bacterial scours," or contagious diarrhoea are the terms employed to differentiate the type of diarrhoea caused by actual infection as distinct from nutritional scours. Again, however, it should be mentioned that the two frequently occur together, beginning as a simple dietetic diarrhoea to which the bacterial infection becomes superimposed.

The vital factor in the establishment of this disease is the multiplication of certain disease-producing organisms within the bowel which rapidly overwhelm the calf, the diarrhoea being produced by the irritant action of the germs and their products on the bowel wall. Once this condition becomes established, thousands of the bacteria are poured out with increased virulence in the foetid droppings and rapidly infect other calves.

Two Faults

The disease can arise through two faults in management:—

(1) Improper feeding, leading to a digestive upset and enabling the bacteria to become established. The bacteria are present in the intestines of all calves, but normally are kept well in check. Should any conditions such as indigestion—due, for instance, to overfeeding—arise, the bacteria begin to multiply, increase in virulence, and establish themselves as disease-producing organisms.

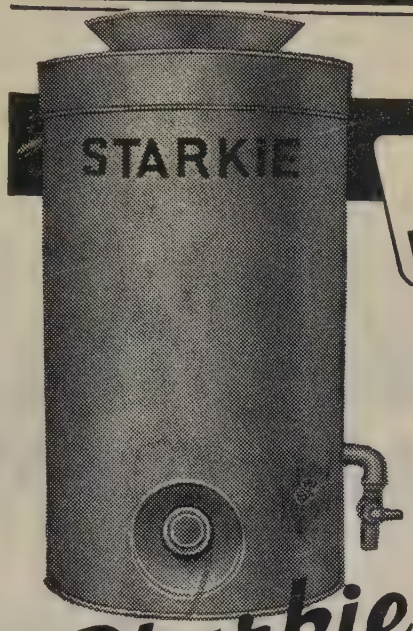
(2) The feeding of contaminated milk, by which the organisms are poured into the calf's stomach with the food. The latter fault is inexcusable; absolute cleanliness in food and utensils is of paramount importance.

Treatment and Prevention

Treatment and prevention involve the same principles, and are intimately related to the management and feeding. Both nutritional and bacterial scours are responsible for heavy losses through fatalities and by the fact that surviving calves are frequently sickly and unthrifty. A knowledge of prevention and treatment is therefore essential.

The first essential in treatment is the elimination of the factors concerned. A careful study of the dietetic influence in an epidemic of scours shows that consideration for this alone will aid largely in checking disease where other efforts fail. In cases with contaminated food, if the unhygienic conditions underlying are continued it is only a matter of time when heavy losses will occur.

To prevent or treat nutritional scour arising from overfeeding it is essential to reduce the amount of milk fed at any one feed and to feed three times a day for the first three weeks. In the first place, the calf should be fed for the first four or five days on the colostrum, or first milk, from the dam. For the first week feed two pints of milk per feed, that is, six pints per day; in the second week increase to 2½ pints per feed, and in the third week to three pints.



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It is a wise plan in prevention to add about half a pint of water to each feed of milk. Feed whole milk for the first fortnight, and at the end of the second to third week the change to separated milk may be begun and completed within one further week. Feed then at the rate of one gallon per 100lb. liveweight.

Should scour develop for any reason, treat immediately by giving a dose of castor oil, 1 to 2 ounces in warm water, according to the age of the calf, and at the following feed allow only warm water which has been previously boiled. Then allow only half the normal quantity of milk (making up the volume with water) for a few days until the condition has cleared.

—B. A. TAYLOR, Veterinarian, Dunedin.

Answers to Correspondents

Loss of Ewes.

"STUMP" (RANGITIKEI):—

I have been a contributor and a regular reader of the "Journal" for years, and now I seek your help and advice.

Every spring we lose a number of ewes from a complaint known to some people as pneumonia. The sheep are generally apparently quite O.K. one day, but the next are found lying dead with a quantity of pinkish froth coming from their mouths or noses. This year the ewes have been running on turnips for three to four weeks. They have a grass run off at night. The weather for the past few weeks has been frosty and fine days. The sheep are running on dry ground.

Could you tell me the reason for this complaint, the symptoms, and the cure if there is one? I have lost only two sheep this way this year, one about three weeks ago and one this morning (July 23). The first one was running solely on grass. I am running about 1000 ewes.

Secondly, I had a cow calve on July 21, and she failed to clean herself of the cleanings. On the 22nd I gave her half a packet of a well-known drench at 10.30 a.m. As this had no effect I gave another half-packet at about 5.30 p.m. On the 23rd she had not cleaned, so I put my hand inside her and loosened the cleanings from the buttons holding them in place. After this I got them all away from her O.K. When I had got all these away I swilled out her passages with weak disinfectant in warm water. As this is the first time I have had to attempt this class of job with a cow I would like your help or criticism or any suggestions as to a better (or other) method. I might mention I have had about 13 or 14 years among sheep in the spring-time, lambing, etc.

Could you also inform me as to the method used to remove young calves' horns with caustic pencil or stick?

Could you give me a recipe for a sheep salt lick suitable for use on a heavy loam soil with a very stiff clay subsoil—a lick suitable for mixing at home?

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

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LIVESTOCK DIVISION:—

In reply to your remarks regarding the loss of some ewes at this time of the year, it is almost impossible to state the cause of death without a post-mortem examination of a dead animal. It is not likely that the ewes died from pneumonia. The evidence of froth at the mouth and nostrils following death does not suggest pneumonia, as this is quite commonly seen following death from other causes.

As death seems to occur so suddenly one would suspect death to be due to some acute bacterial infection, such as malignant oedema. This matter could only be cleared up by a post-mortem examination and a laboratory examination of specimens sent forward.

An occasional loss from an infection of the nature suggested is quite commonly seen, and your loss of two sheep out of a thousand is quite a good record. If, however, your losses continue, or increase in number it would be advisable to have the matter investigated by communicating with the nearest office of this Department. It is quite difficult to control some of the bacterial infections in sheep, and no suggestions as to prevention or cure can be advanced at this stage.

Dealing with the question of the removal of the membranes in a freshly-calved cow, the procedure adopted by you is quite sound, and no criticism of your method is called for. It is presumed the cow calved up to normal time. In cases of retention following abortion it is frequently most difficult —in some cases impossible—to strip or release the membranes from the buttons.

In such cases, the membranes may require to be left for a few days, and a policy of regular swilling out of the womb with plenty of warm antiseptic solution is followed. Where the membranes are removable by hand, all that is necessary is to use care, cleanliness, and thoroughness to ensure that no injury is inflicted and that no small portion of the membranes is left behind.

In regard to the prevention of horn growth in very young calves, all that is necessary is to clip the hair around the base of the horn bud. Moisten the end of the caustic stick and rub thoroughly into the horn bud, taking care that no caustic drops run down the face of the calf. The application of the caustic may be repeated after one week, but usually one application is quite satisfactory in stopping the growth of horn by destroying the horn-secreting tissue.

If the calf is several weeks old it is necessary to clip the hair as before and remove the small horn buds with a sharp knife before applying the caustic stick. In such a case the caustic will assist in stopping any bleeding, and will destroy the horn-secreting tissue.

The two latter questions have been dealt with in the August issue of the "Journal."

A suitable mineral lick for sheep on your farm may be prepared by mixing one part of sterilised bone-flour with three parts of coarse salt. You should have no difficulty in obtaining these two ingredients and mixing the lick at home as suggested by you.

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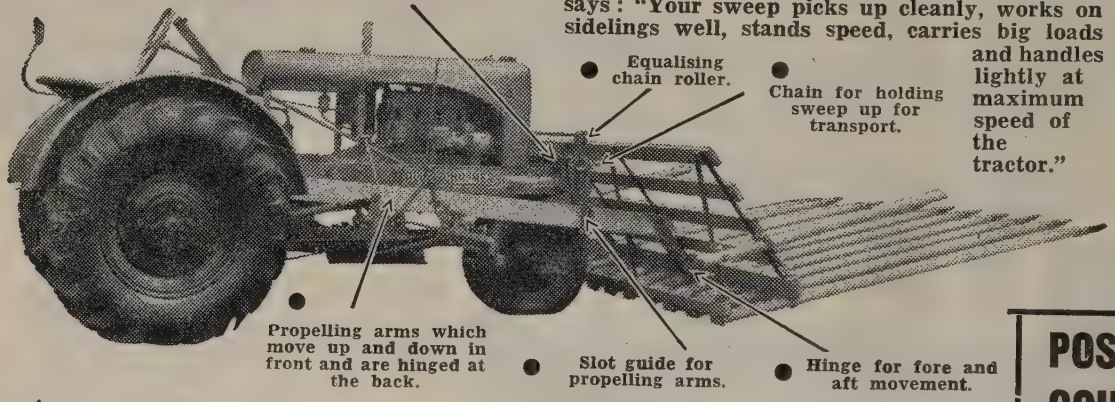
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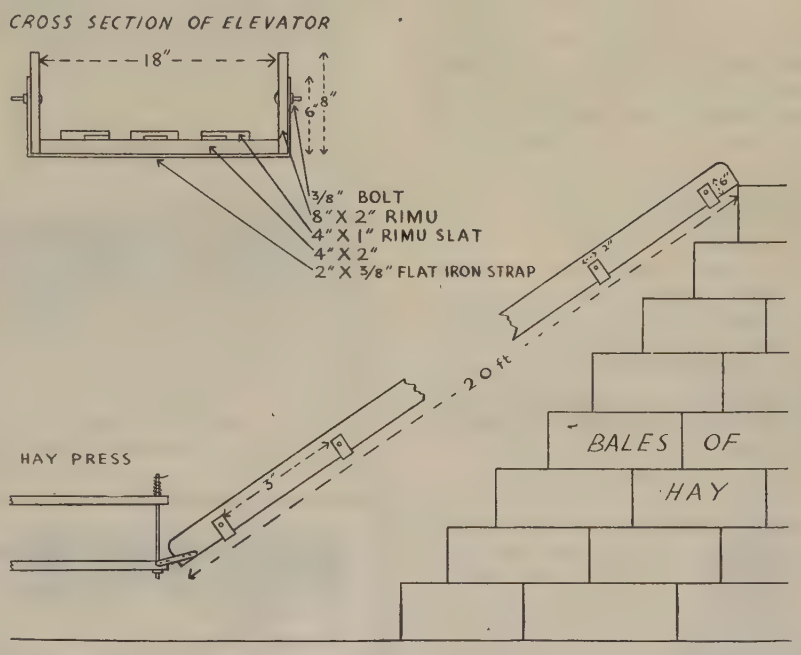
Farm Practice and Management

Contributed by Officers of the Fields Division

Loader For Attachment to Hay Baler

IN last month's issue of the "Journal" notes of a labour-saving device for hay baling which has been used by Mr. M. C. Connor, Omapere Station, were published. A loading chute or elevator may be built to attach to any make of hay press, and most practical farmers will be able to think out a method of attachment. However, the accompanying diagram should prove a guide to building and attaching to the press.



In Mr. Connor's case the elevator is 22 feet long and loads with ease up to 9 feet high. This should be high enough for the average stack, as it is a simple matter for the person taking the bale from the elevator to stack it at least another 5 feet higher. If a longer elevator is desired it may be built in two sections and bolted together, but in many cases a shorter elevator might suit the purpose, in which case it could be constructed in one length of, say, 18 feet or 20 feet timber.

The sides may be constructed of rimu 8 in. x 2 in. and held together at intervals of 3 feet by a strap made of 2 in. x 3-8 in. flat iron bolted on to the sides, the heads of the bolts being counter-sunk. Where these straps are situated a piece of 4 in. x 2 in. rimu 18 in. long is jammed in tight on top of the strap for strength. This timber, with the straps underneath, provides the floor joists on which the floor is fastened. The floor consists of three 4 in. x 1 in. rimu spaced 1½ in. apart and running the length of the elevator. The timber may be dressed inside if desired, but dressing is unnecessary, as the passage of the bales very soon wears the timber smooth.

The elevator is attached to the press, and for a start one end may be propped up only one bale high and raised as

YOU CAN BE SURE OF SHELL

the stack of bales accumulates, or it may be raised up on to the deck of a lorry if the hay is to be carted immediately from the paddock. No extra power appears to be necessary to operate the loader, for as each bale is pressed and forced out of the press it simply pushes its immediate predecessor along the elevator until there is an unbroken line of bales to the extreme end. The only extra material required for working will be a few more boards for inserting between the bales. About six extra should be sufficient, and these are simply thrown back to the press as they come off, or each board may be fitted with a hook and run back on a wire to the press operator.

—R. P. HILL, Fields Instructor, Hastings.

Simple Straightener for Baling Wire

BALING wire is now precious, and farmers are urged to eke out their present stock and make it serve for several seasons instead of only one.

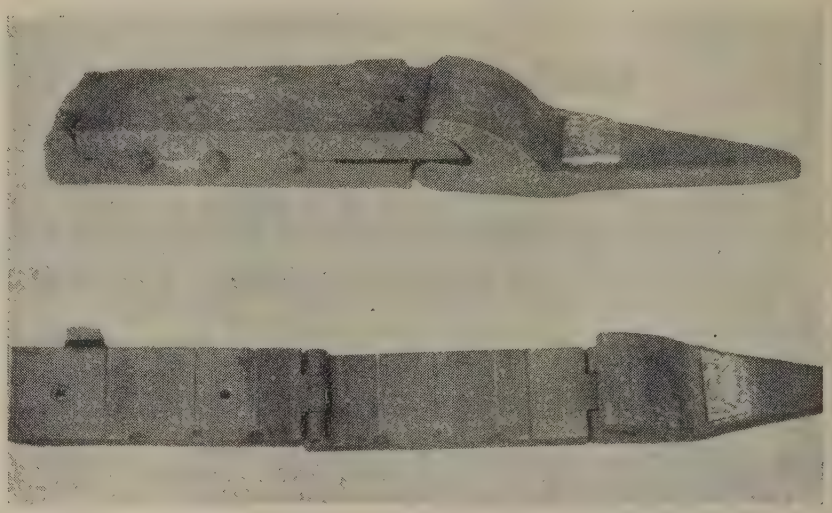
When the hay is emptied out of the bale the wires should be collected in small straight bundles and carefully hung up in a shed until they can be made ready for use again. Only too often does one see various pieces of baling wire in odd corners, and, worse still, it is left lying around paddocks where it is always liable to catch in the mower.

Before the wires can be used again the kinks must be taken out, and this is a suitable job for a wet day. Some farmers pull the wires through a vice which has a slot filed in the jaws, but Mr. R. O. Dixon, of Eyreton, Kaiapoi, has patented a special device for the job, and, in view of the scarcity of wire and the need for economy, it is well worth while describing the tool

The straightener is made of two pieces of cast-iron hinged together at one end and having at the other an automatic catch. Three slots are provided for different gauge wire, and on one side the entrances to the slots are gouged out so that the kinks do not stop the wire from being pulled through. Two men working together, one feeding in and the other pulling, is the best working arrangement. The locking mechanism is a great time-saver, and the machine is a good solid article which should last for many years.

Screw holes are provided for attaching it to a bench, or it can simply be held in a vice. Mr. Dixon himself has used it for several years, and the fact that his wire has now done four seasons should interest many readers.

—A. S. NASH, Instructor in Agriculture, Rangiora.



Above.—The straightener closed, showing the automatic locking device and gouged-out entrances to the holes. *Below.*—The straightener opened out, showing the slots for different sizes of wire.

HESKETT SLAG

Many soils of high-rainfall parts of New Zealand lack Lime, and contain large quantities of Iron and Allumina, which rob the farmer of about four-fifths of every ton of Water-Soluble Phosphates spread on these soils; a Basic Slag contains, among other minerals, large quantities of a non-acid chemical compound known as Calcium-Silico-Phosphate which, it is claimed, has the power of unlocking these dormant minerals from the soil. The phosphates of a Basic Slag cannot be locked up by these soils because they are already combined in a form easily digested by the root acids as they need them.

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Surface-sowing of Ratstail Swards

ALTHOUGH ratstail is a very useful species of grass in pastures in certain localities, its invasion of pastures in the better districts where good swards are the general rule is particularly undesirable. Such a position occurs in parts of North Taranaki where the soils are of the type suited to ratstail, being very light in texture and in places of a sandy nature. Such soil types are ideal for the spread of ratstail, and on the coastal portion of the district the invasion is particularly heavy in places, always occurring on sunny or partly-sunny faces of down and hill country and on the hillocks of the South Coast. Apart from the coastal portion of the district, ratstail has spread in varying degrees and is found over the whole of the district.

Eradication.

Ratstail can be eradicated by ploughing, suitable cultivation and resowing in a good pasture mixture, but such a course is not always economic, and on very steep country cannot be carried out at all. Generally, the portion or portions of the field occupied by the grass may be only a small part of the whole area, and it is in such situations that other means are employed to check the grass and generally improve the nature and palatability of the sward. This is done by surface-sowing with a suitable pasture mixture, with, of course, adequate seed bed preparation by the use of harrows of the drastic type.

On very steep country where cultivation of any sort cannot be carried out, the use of sheep is recommended. By concentrating sheep on ratstail faces the fertility is generally raised by droppings and urine, and the close grazing habits of sheep will do much to lessen any unpalatable growth.

Improvement by Oversowing

Where possible, ratstail areas should be fenced off and the area grazed hard with heavy stock, such as cattle and horses, and then drastically harrowed to prepare a seed bed and to remove as much of the undesirable grass as possible. Harrowing also injures the crowns of ratstail, thereby weakening and killing out a proportion of the grass. On faces where the growth is very rank it may be possible to burn off the area, which will simplify any seed bed preparation and at the same time give a certain amount of ash.

Together with from 2 to 3 cwt. of superphosphate the following pasture mixture should then be sown on the area:—

Cert. perennial ryegrass	16 lb. per acre
Cert. white clover ...	2 lb. per acre
Crested dogstail	2 lb. per acre
Paspalum	5 lb. per acre
Total	25 lb. per acre

Should paspalum not be desired in this mixture, it can be deleted with an addition in ryegrass, but paspalum will do much to obtain a better sward, especially on the type of country in the district. After sowing and topdressing the area, the seed should be harrowed in with a set of light harrows, and on very steep country the seed can be tramped in by driving a mob of sheep across the sowings.

Stocking

The fencing of ratstail areas is a considerable help in future control, for stocking plays an important part in the further improvement and general carrying capacity of the sward. However, the introduction of useful species into the sward will generally be an attraction to stock, and under efficient grazing management should bring back many areas now throwing little feed on so many farms.

While it is admitted that many of our ratstail faces cannot be fenced, it is certain that surface-sowing with the above mixture and topdressing will do a great deal in improving these at present low production areas.

With the increase in primary production at present in demand, any improvement in our pastures must have a desired effect, for it is from these pastures that the basis of that production is taken.

—J. M. HOPKINS, Instructor in Agriculture, New Plymouth.

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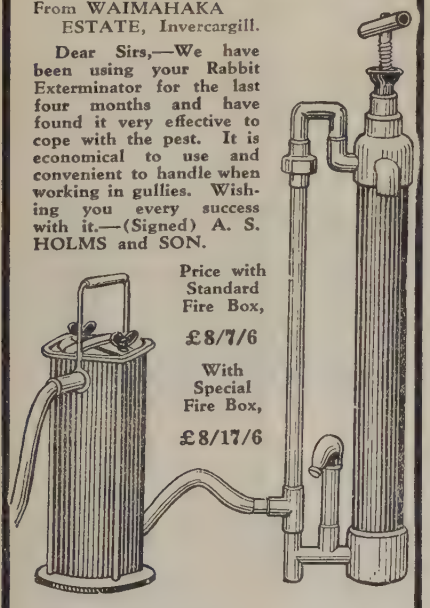

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The Orchard and Vineyard

Contributed by the Horticulture Division

Orchard Notes

Seasonal Operations for the Coming Months

THE following seasonal operations will be necessary during the coming months:—

Cultivation to conserve moisture.

Spraying for various pests and diseases.

Thinning of stone fruits.

Disbudding.

Miscellaneous operations.

Reference has frequently been made to and much advice given on spring and summer work, but a few further notes may not be out of place.

Cultivation

Thorough cultivation of the soil is an essential feature of successful fruit-growing from now onwards. Throughout the summer the surface of the soil should be kept free and loose. When properly maintained, such conditions provide the only practical means of preventing the evaporation of the soil moisture. This applies in those districts which are more or less subject to spring and summer droughts.

How frequently cultivation should be done will depend largely upon weather conditions. The soil should be moved after heavy rains and as soon as it is dry enough to prevent a hard crust forming. If this is done the fruit trees will respond, and moreover, are more likely to remain healthy and vigorous.

Spraying

The principal diseases that will need watching during the coming months are:—

(1) Black Spot—Apple and pear.

(2) Codling Moth—Apple and pear.

(3) Powdery Mildew—Apples.

(4) Scales of various kinds—Apples. pears, stone fruits.

(5) Red Mite. Apples and stone fruit.

(6) Brown Rot—Stone fruits.

(7) Bronze Beetle—Apples.

The spraying programme as set out last month covers apples and pears. In addition to this, it will be necessary in some districts to spray for the control of brown rot on stone fruits.

The following is recommended for this purpose one month before picking:—

Lime sulphur 0.83 per cent. = 1-180 plus 2 lb. colloidal sulphur to 100 galls.

It may be necessary to repeat this in two weeks' time, and should be used throughout the stone fruit season in those districts where brown rot is troublesome.

Don'ts in Spraying

Don't use an oil spray on trees that have been sprayed with any sulphur spray for a period of at least two weeks.

Don't combine oil sprays with any of the sulphur sprays or with acid lead arsenate.

Don't use soap spreaders with either Bordeaux mixture, lime sulphur or lead arsenate.

Don't use nicotine sulphate alone; an activator is necessary to liberate the nicotine.

Bronze Beetle

Bronze beetle is causing a good deal of damage to the apple crop in parts of the Dominion, and inquiries are frequently made as to the most effective method of keeping this pest in check. The bronze beetle causes serious blemish to the fruit in the early stages of growth which disfigures the outer surface, and thereby prevents it being placed in the higher grades. Moreover, it is often so serious that the fruit is rendered unfit for sale.

Much experimental work has been carried out by spraying for its control, but nothing of any importance has been discovered, and one can only reiterate what has so often been stated, namely, that clean cultivation in the orchard is one of the best aids to controlling it, and that any breeding grounds adjacent should be removed.

Thinning Stone Fruit

The thinning of stone fruits is often neglected, but it should be done wherever the setting has been heavy. The best time for this work is just after the stoning period, which is usually during November. If left too late, it will not have the same value as if it was done reasonably early.

Thinning should be done in such a manner as to allow each fruit to develop properly. While no stated distance can be given, it is well to note that no two fruits should be touching each other. If a reasonable spacing of the fruiting laterals was done during the winter pruning the thinning of the fruit will be a much simpler operation

Disbudding

It will amply repay growers of young trees to devote a little time during the spring and early summer months to disbudding, pinching out unnecessary shoots, spacing leaders, etc.

Don't forget to watch the leader growth, and should one or more of these be growing exceptionally strong to the detriment of the remainder,

carefully pinch the terminals of the strong ones. This will enable the weaker ones to catch up in growth, and the main foundation leaders are likely to develop more evenly in height and strength, which is desirable. Many orchards contain lopsided trees, which could have been prevented by a little care and attention during the first growing season.

Miscellaneous

(1) Watching young grafts and releasing the ties.

(2) Growth from budded trees may need attention.

(3) Drains may need a little attention.

(4) Staking young trees may be necessary.

(5) Where large limbs were removed from old trees during winter pruning, strong unnecessary water shoots may need removing.

Case Supply

As the early stone fruit will soon be ready to harvest, a good supply of case timber should be on hand. This can be then made up during periods of broken weather and stacked up in readiness for use. All fruit cases should be well seasoned and kept dry, as green or wet cases are detrimental to the fruit.

The following points should be carefully considered for successful marketing:—

(1) Clean, well-made and attractive cases.

(2) Suitable case-liners for quality fruit.

(3) Fruits graded to size, maturity and appearance.

(4) Cases well packed and neatly branded.

—L. PAYNTER, District Supervisor, Auckland.

Citrus Notes

Spraying and Pruning Work

IN last month's notes for the "Journal" a spray programme was set out for the current season. It is important that these sprays be correctly mixed and that only certified therapeutants be used.

Bordeaux Mixture

Precautions necessary in the preparation of Bordeaux mixture 3: 4: 50 are that the hydrated lime is fresh, or, if stored over the past winter, that it has been stored in an air-tight container so that it has not reverted to the carbonate by the action of the carbon dioxide of the air and thus become useless. Secondly, the bluestone must not be dissolved in an iron or tin vessel, as chemical reaction is

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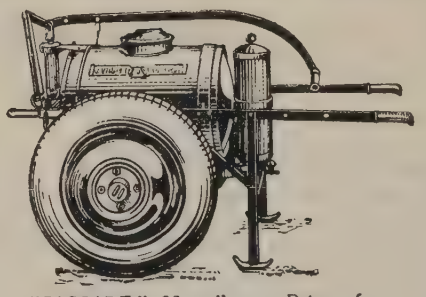

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likely to occur, destroying the container and affecting the bluestone. Thirdly, the bluestone should be thoroughly dissolved before the addition of the hydrated lime. The lime should have been dissolved in a separate vessel and not added as a powder straight to the bluestone.

Summer Oil

Of all the certified summer oils, only one is approximately 100 per cent. oil, the others having a lower oil content. In such instances, if results are not obtained in citrus red scale control, then 3¾ gallons of the oil should be mixed with water to the consistency of thin cream and then added to the spray tank, the tank being subsequently filled to the 100-gallon mark.

If it is desired to mix the summer oil with Bordeaux, the Bordeaux should always be prepared first and the summer oil added as a thin cream while the agitator is kept running. If arsenate of lead is being added to Bordeaux, it should also be made into a paste and added to the Bordeaux already prepared. When nicotine is added to summer oil it should be added after the summer oil spray solution has been prepared.

It is important that sprays be correctly mixed; otherwise they may be useless, and also there is also the definite risk of spray injury—the cure thus being worse than the disease it was desired to control.

The principal citrus diseases which cannot be controlled wholly or partially by spraying are briefly as follows:—Bark-blotch, brown-rot, collar-rot, Sclerotinia, citrus-borer, dicky-rice-weevil, Cicada, citrus-blast, citrus-canker, frost injury, hail-injury, sunscald, gum-spot, oil-spot, and mottle-leaf. Reference to the necessary control measures for these diseases will be made in next month's notes.

By this season of the year trees should be in clean cultivation. The area around each tree should be kept lightly hoed, and the spring application of manures, as previously outlined, should have been made.

Pruning

The pruning of citrus trees should be receiving attention, and this is a suitable opportunity to revise the principles of citrus tree pruning. When doing this work, these objects should be kept in mind.

(1) To obtain regular crops of good quality fruit and of adequate quantity.

(2) To maintain thrifty fruiting wood throughout the tree by admitting adequate air and sunlight.

(3) To maintain a strong framework capable of carrying large crops.

(4) To remove all crossing branches which are apt to cause rubbing and weaken main limbs.

(5) To remove all dead, dying, and diseased limbs.

(6) To permit adequate spray coverage.

(7) To control the height of trees in order to be able to harvest crops as much as possible from ground level.

(8) To encourage the horizontal fruitful branch and discourage the vigorous upright branch.

For many years there was a common belief that evergreen trees required no pruning, and many commercial growers adopted this principle. The result has been the rapid decline of many citrus trees soon after they reached maturity, and the period of maximum fruitfulness is not maintained. On the other hand, do not be too drastic, especially with the lower fruitful branches of younger trees. If in doubt—leave it!

—A. W. M. GREIG, Citriculturist, Auckland.

Viticulture

Grape Anthracnose, or Black-spot Of the Vine

BLACK-SPOT is the oldest recognised disease of vines, and is as old as civilisation itself, having been referred to by the writers of Ancient Greece and Rome. It is caused by a parasitic fungus, botanically known as *Gloeosporum ampelophagum*. All green parts of the vine are subject to attack —shoots, canes, leaves, and bunches.

Conditions Favourable to the Disease

Like most fungi, heat and moisture are necessary, but black-spot develops at a lower temperature than many other fungous diseases. Locality plays an extremely important part, vines in low-lying areas being more susceptible. It is often noticed that the intensity of the disease varies in different portions of the same vineyard.

Infection is usually greater in hollows and moist portions liable to fog and heavy dew than in the higher situated and better drained areas. The heavy clay gum soils are particularly conducive to the spread of anthracnose.

Variety plays quite a considerable part in the warmer overseas countries, but unfortunately varieties that are practically immune in those countries, such as the Pinot's, Syra, or Red Hermitage as it is known here, Sauvignon, etc., do to a certain extent become infected in the colder and damper New Zealand conditions. Nevertheless, these varieties are certainly more resistant than many of the other popular ones, such as Cabernet, Malbec, Palomina, Malingre, Chasselas, etc., the direct producing hybrids.

Outward Appearance

The disease is well known in the majority of districts, and most growers are familiar with its appearance. However, there has been a slight confusion in areas where the infection has not been as heavy, as the markings left by powdery mildew are sometimes mistaken for black-spot.

Once seen, the appearance of a bad infection of black-spot in the spring is not easily forgotten. The young shoots are stunted, the foliage is more or less blackened with spots, and the bunches are withered. All the growing parts of the vine are seared with scars, and the leaves are often perforated.

During the growing period of the vines the disease usually appears first as pin-head spots which are slightly

sunken in the centre and raised at the borders, the spots on the shoots tend to become elongated in the direction of the main axis, the colour becomes of a greyish black nature, and finally definite cankers are formed. The canes twist as though burnt; the partial destruction of vessels interferes with the sap supply, and the resulting starvation causes the canes to become stunted. The bark may be destroyed, and in severe cases the underlying wood has a burnt appearance.

The most serious damage usually occurs early in the season, before blossoming, and vines attacked badly at this stage will often lose their whole crop. Serious harm can also be done when the fruit is at half size or larger, the appearance of table grapes being seriously harmed and the quality of wine seriously impaired.

On the berry, black spots are formed, the centre turns greyish and sinks in, the spots are surrounded by a black edge. When moist conditions are prevailing infected berries often burst.

Infection and Propagation

The fungus is propagated mainly by spores, which are formed at the end of fungous threads in the affected tissues. The spores are produced in great quantities, so that a single scar at the fruiting stage is capable of sending out enormous numbers of spores.

Immature grapes infected with black-spot.

During the growing period of the vine the fungus is spread by conidia or summer spores, and during the dormant season in winter it is passed in several ways, hibernating mycelium, sclerotia, and other forms. Summer spores germinate in water, which is present as rain, dew, or fog; without this moisture germination cannot take place. If the climatic conditions are suitable the spores which fall on the green portions of the vine may germinate, and approximately a week later the first signs of black-spot begin to appear.

With black-spot there is a well-defined method of over-wintering. As winter approaches, the growth which invaded the tissues during the growing season, becomes dormant, forming compact bodies known as sclerotia. In the spring these sclerotia swell, tear the cuticle, and give rise to spores for the new infection. The germination takes place at fairly low temperatures, and hence the possibility of early infection. The spread of the disease is, however, more rapid when weather conditions are both moist and warm.

(*To be continued next month.*)

Frost Prevention and Fruit Russetting

By N. J. ADAMSON, District Supervisor, Nelson.

THE question has been raised by Nelson orchardists as to the possibility and practicability of preventing fruit russetting by using frost prevention methods in the orchards.

While it must be generally admitted that low temperatures while the fruit is still tender are a main cause of fruit russetting, it would definitely be an uneconomic undertaking to attempt anything in the way of orchard heating unless there was actual loss of crop occurring and the remaining crop was suffering such severe injury through russetting and deformities as to become almost unmarketable.

Because of the high capital cost of installing frost-fighting appliances and also the high operating costs it would be necessary to consider the matter very carefully before being committed to the expense. In certain circumstances frost prevention by orchard heating pays.

However, there are many areas which fall into one or other of two categories where frost prevention would not pay—(*a*) areas where frost damage is so frequent and so severe as to cause actual crop loss, thereby making the cost prohibitive; (*b*) areas where frost damage is so slight and so infrequent that there would be no gain through such a high capital outlay. The Nelson district would come into the second type, as only once in the last 10 years has any appreciable loss occurred, and then in one area only.

In considering the question of fruit russetting only and the possibility of reducing it by orchard heating it is logical to state that damaging temperatures would be somewhat higher than those at which actual fruit losses occur, and therefore the necessity for orchard heating would arise much more frequently and so frequently as to make the cost prohibitive. While a temperature of 29 deg. F. would destroy small green fruits, any sudden drop in temperature without actually freezing may cause russetting, so that it becomes obvious that orchard heating under such circumstances, even if possible, would be quite out of the question. Low temperatures could occur without temperature inversion, in which circumstances orchard heating is not possible.

Fruit russetting, when it does occur, is always more severe on trees in poor condition where, through lack of cultivation and fertilisers, stagnation in growth has come about. Trees suffering through lack of drainage invariably produce more russetted fruit than their healthy counterparts nearby. The younger apple trees just coming into their prime invariably produce clean-skinned fruit, as most of the fruit is produced on vigorous spurs on comparatively young wood.

This in itself suggests a pruning treatment for older trees which should be designed to stimulate some new growth to be employed for fruiting and for replacing the older and weaker spur wood, which, if situated in the lower and shaded parts of the tree, very often produces undersized and russetted fruit.

Pests

Rust-fly.

Rust-fly (*Psila rosae*) is a serious pest of celery in the Auckland Province. The larvae of this fly feed on and in the roots and crown of celery, causing characteristic rusty-coloured burrows in the thicker tissue. In the case of badly infected plants the outer leaves wilt and turn yellow because of the destruction of the fibrous roots.

The larvae are slender, yellowish-white, legless maggots about ⅓ inch long when full-grown. When a badly infested plant is pulled up portions of these maggots can usually be seen protruding from the burrows.

The flies lay their eggs in the soil round each plant, and when these hatch the maggots make their way to the roots. If the plant is attacked in its young stages very serious injury may result, as the whole of the underground portion may be destroyed. If attacked when it is well grown and the root large, the plant usually suffers much less.

The pest over-winters in the soil in the pupal form or as larvae in the roots of its hosts, which are carrot, parsnip, celery and parsley.

Where the rust-fly is troublesome, celery should not be planted in soil which bore an infected crop the previous season. Plants which have been damaged so severely that they are of no further use should be taken out of the ground and destroyed.

The flies may be prevented from laying their eggs in the soil around the crop by dusting crude napthalene over the area to be protected at the rate of 1 cwt. per acre. Give a dressing every 10 days, beginning as soon as the young plants are established, and continue until the end of December.

Aphis.

Celery is sometimes severely attacked by the green aphis, *Cavariella aegopodii*. The willow is also a host of this insect, and the winter is passed in the egg stage on this tree. Whenever celery is grown in the vicinity of willows it will usually be found to suffer from this pest.

To control, spray with nicotine sulphate 1-800, plus 3 lb. soft soap per 100 gallons water.

—F. SYDENHAM, Assistant Horticulturist, Wellington.

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APIARY NOTES

Contributed by Officers of the Horticulture Division

Operations in Queen-rearing

(Continued from the September issue.)

BEE-KEEPERS should re-queen every colony where there is an indication of a failing queen, as described in last month's apiary notes, and should make a practice of re-queening all colonies at least every second year.

Although queens may be raised successfully in large numbers and the time is now opportune for this work, it is not always easy to introduce a laying queen to a strange colony to replace an old one. Bees, in common with all forms of animal life, immediately recognise a stranger, who is looked upon with suspicion. It is therefore necessary to allow the bees to become accustomed to a new queen before she is released, otherwies she is almost sure to be seized and killed.

Protection is provided by the use of a wire cage plugged with candy which allows the bees to cultivate an acquaintance gently with the imprisoned queen. Her release is brought about by the consumption of the candy, by which time the bees have become accustomed to her and she will be accepted as the new mother of the colony.

Making Suitable Candy

While queen cages can be purchased from almost any dealer in apiary appliances, it is not possible to purchase a suitable soft candy for the nourishment of the queen and her attendants while on a journey by mail or during confinement for the purpose of introduction. It therefore becomes necessary for bee-keepers to make their own candy. A common mistake is to make the candy too soft, which very often results in the death of attendant bees and valuable queens. This can happen by the bees continually rubbing their bodies against the soft candy while moving about the cage, which gradually blocks their breathing tubes, and they fret and die.

Another common mistake is to boil honey and mix the necessary ingredients at high temperatures. Boiled honey is not desirable as a food for bees during a period of confinement Its use will cause dysentry and the death of the bees in a very short time.

Proper Use of Honey

Although it is possible to make a good candy without the use of honey, thus completely avoiding the possibility of foul-brood infection, bee-keepers whose apiaries are free from disease will find it more convenient to use honey in the following manner:— Take fresh honey from a clean hive, or render a good quality honey thoroughly liquid at a temperature not above 140 deg. F., then mix with cold powdered sugar. Stir the honey into the powdered sugar until it is no longer possible to stir with a spoon Then remove the mixture to a board and knead the mass thoroughly, adding more powdered sugar as it can be taken up.

The proper mixture of the candy is reached when the ball stands up with very little flattening at the bottom, and is then ready for use. If the candy is kept for future use and becomes moist and softer, more powdered sugar must be kneaded into it before use in the queen cages.

Successful Introduction

The cage containing the new queen is placed in the de-queened colony between the frames in the brood nest, with the candy end placed upward to prevent clogging or stopping of the escape hole by any dying bees within the cage. Whether the queen is accepted or not depends largely upon the temperament of the colony, especially at the time the queen is released.

Successful introduction is more common during the period of a honey flow, at which time the older field bees are busy with field duties and the colony as a whole is fully occupied with work; also, the new queen is more likely to be accepted if she remains quietly on the combs and does not run wildly among the bees. It is therefore all-important to raise queens from the best strains of quiet bees.

Finding Black Queens

Another problem in the spring, or at any time when colonies of black bees are to be re-queened, is to find the queens. A good plan which will save much time and labour is to place a super of empty combs on the hive containing the black queen, smoke the bees through the entrance sufficiently to start them moving up into the super above, then drum on the bottom box for about one minute. This drumming should be repeated after a few minutes and a queen-excluder placed between the top and bottom box, after which the lid is removed and each comb above the excluder is quickly examined for the queen. If she is not spotted, the bees on each comb, following examination, should be shaken down into the super and the combs placed handy.

The drumming process will induce the bees, and especially a black queen, to move up into the top box, where she is held by the queen-excluder. A short time after the second drumming the bees will move back to the brood nest below, but the queen is trapped by the excluder and is easily caught. A great deal of valuable time is saved by this method, especially if a number of black colonies are to be re-queened.

This method is not necessary to locate Italian queens because of their distinctive colourings and quiet manner on the combs.

Laying Workers

Occasionally when a colony is unsuccessfully re-queened by the bee-keeper and the bees fail to raise a queen from their own brood, a number of worker bees eventually start to lay eggs. The eggs are laid in worker cells, but develop into drones. All drones developed in this way are much smaller than those developed

(Continued on page 303.)

Pests

Rust-fly.

Rust-fly (*Psila rosae*) is a serious pest of celery in the Auckland Province. The larvae of this fly feed on and in the roots and crown of celery, causing characteristic rusty-coloured burrows in the thicker tissue. In the case of badly infected plants the outer leaves wilt and turn yellow because of the destruction of the fibrous roots.

The larvae are slender, yellowish-white, legless maggots about ⅓ inch long when full-grown. When a badly infested plant is pulled up portions of these maggots can usually be seen protruding from the burrows.

The flies lay their eggs in the soil round each plant, and when these hatch the maggots make their way to the roots. If the plant is attacked in its young stages very serious injury may result, as the whole of the underground portion may be destroyed. If attacked when it is well grown and the root large, the plant usually suffers much less.

The pest over-winters in the soil in the pupal form or as larvae in the roots of its hosts, which are carrot, parsnip, celery and parsley.

Where the rust-fly is troublesome, celery should not be planted in soil which bore an infected crop the previous season. Plants which have been damaged so severely that they are of no further use should be taken out of the ground and destroyed.

The flies may be prevented from laying their eggs in the soil around the crop by dusting crude napthalene over the area to be protected at the rate of 1 cwt. per acre. Give a dressing every 10 days, beginning as soon as the young plants are established, and continue until the end of December.

Aphis.

Celery is sometimes severely attacked by the green aphis, *Cavariella aegopodii*. The willow is also a host of this insect, and the winter is passed in the egg stage on this tree. Whenever celery is grown in the vicinity of willows it will usually be found to suffer from this pest.

To control, spray with nicotine sulphate 1-800, plus 3 lb. soft soap per 100 gallons water.

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(Continued on page 303.)

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Rearing of Young Stock

WITH the work of incubation completed for the current season, the poultry-keeper should concentrate as much as possible on routine work connected with rearing young stock to replace older stock, later to be culled on completion of their productive usefulness.

Prevention Of Disease

Foremost considerations suggest sanitation and cleanliness. If one expects to rear healthy stock, then methodical measures must be taken to ensure clean conditions. No risks or chance methods should be allowed to creep in whereby the chicken may be subjected to risk of infection with parasitic life or disease germs or organisms. Summer and autumn weather conditions are sometimes favourable to the spread of disease, especially where damp weather conditions are later followed by a hot spell.

With the ever-increasing risk of soil contamination where flocks are run over the same ground for year to year, such troubles as parasitic life and coccidiosis are very apt to appear, and once they do they are very hard to control or even eradicate. It is therefore a sound policy to manage a plant so that they have little chance of gaining a foothold. Prevention must always be considered as the first line of defence.

One cannot over-emphasise the necessity when coccidiosis is suspected of having been present during the last rearing season, of changing the litter under the brooder and on the floor of the brooder house at least twice weekly. Dry conditions are essential to its control, and a dusting of dry slaked lime on the floors of the brooder house before bedding down with chaff, etc., will assist much in obtaining this condition.

This provision will serve a double purpose in preventing subsequent droppings from sticking to the floor and thereby assisting sanitary measures. It is in quarters where dampness is present that conditions are so favourable to the incubation and spread of disease troubles.

Care in Feeding

When coccidiosis is known or suspected to have been present, feed all foodstuffs in troughs to prevent risk of contamination by droppings, which is the main source of infection. For this reason the writer does not view favourably the common practice of feeding grain loosely among the litter to provide scratching exercise when disease is suspected or known to have been present. Of two evils, choose the least, and in this case prevention of disease is most important. Adequate exercise can be provided by other means, such as dry mash feeding or providing green foodstuffs in wire baskets suspended so that the chickens have to jump up to secure their requirements.

All foodstuffs should be carefully controlled in order that they reach the birds without contamination. The path outside the brooder house should be such as to permit thorough cleaning. Loose earth or shingle paths are not readily cleaned, and are a ready-made means of introducing the trouble to the brooder house by means of one's boots, thus countering any methods which may have been adopted inside to combat the trouble.

As a precautionary measure the runs where the chicks exercise should be heavily limed, and if of loose, porous soil liable to drift under windage either returfed with fresh pasture or topdressed with fresh soil and resown with clover and ryegrass or browntop, the objective being to bind the soil and prevent any likely infection from outside of disease organisms.

If these precautionary measures are earnestly applied there is every prospect of the new season's young stock being reared in a healthy manner.

Parasitic Life

It is sound management to treat the young stock when half-grown for internal parasitic life. The usual method of dosing with nicotine sulphate will prove most effective. The dose will have to be considerably reduced according to age and the degree of progress of the stock. At half-grown stage, say, three months, could from two to three pullets as equal to one adult as a guide.

Overcrowding

Overcrowding is a common fault, especially among young growing stock.

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POULTRY FARMERS—

The Gravely All-purpose Garden Tractor will plough or cultivate, sow seed, fertilizer, lime, as well as mow green feed, etc. Also a 5-h.p. Gravely which will do all the above as well as haul transport cart with half-ton load. Many Poultrymen already are cutting labour costs — increasing production — making life easier with a Gravely.

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Far too many pullets receive a definite check from which they seldom properly recover, or even if they do they are never the equal to those raised under good conditions without a check. It is false economy to overcrowd, for numbers do not always spell bigger profits. Where pullets are being raised it definitely pays to understock rather than overcrowd. The birds then have a chance to develop into payable stock with the added possibility of at a later stage being useful specimens fit for breeding purposes.

Undersized, weedy stock are very often the result of overcrowded conditions. The stock may be well bred and of good laying strain, but if the rearing conditions are not favourable, all the breeding selection and feeding will not compensate in this serious defect of overcrowding. It is quality which speaks when net returns are considered, not numbers. It is the effort we make which ultimately produces a given result, favourable or otherwise.

Perching the Pullets

It is at this stage that losses are sometimes experienced, due in the majority of cases either to faulty equipment or to attempting to perch too many birds in one house.

Best results are secured if small batches are taught to perch in suitable houses specially equipped for the purpose. Houses, say, 8ft. to 10ft. wide by 14ft to 16ft. deep will prove suitable and give a capacity of from 60 to 100 chickens. The perches should not be too high from the ground, say, 2ft. 6in., and wire-netting stretched lengthwise on top of the perches. The perches should be about five inches apart.

The rear wall of the house above the perches, especially if of iron, should be provided with wire-netting stretched on the inside surface of the studs above the perches to prevent the young stock from coming into contact with the cold surface of the building, the latter being in some cases a frequent cause of green leg among perching pullets. The corners should be rounded off to prevent crowding in the corners.

A netting frame may be hinged to the outside perch, of sufficient depth when lowered to provide a ramp upon which the chicks may be driven up to the perches above. When all the chickens have been driven to the perches the frame may be raised into an upright position towards the ceiling, thus preventing the stock from leaving the enclosed space. A week or ten days under these conditions will usually suffice to teach chickens to perch, when they can be passed on to larger and permanent quarters.

Green-leg

Green leg is not a contagious disease, but results from effects of a chill, sweating, bad ventilation, or contact while bunched during night conditions with a cold surface. This chills the body, resulting in inflammation, which later manifests itself as green leg. Well-ventilated quarters with dry conditions, together with the precautions outlined above, should ensure freedom from this trouble.

Colony Houses

Where plenty of range is available there is no better way of rearing pullets after being taught to perch than the range system provided by colony houses. These can be cheaply constructed, preferably of light timber, although strongly built on skids or low wheels to facilitate weekly or bi-weekly transfer to fresh ground. Where possible, it pays to reserve some portion of one's farm for this purpose.

A house built on the leanto principle, say, 6ft. wide by 8ft. deep, would provide early accommodation for, say, 40 to 60 pullets. The numbers would need to be reduced as the stock develops.

Feeding

In the early stages of brooding, up to a month or six weeks, milk or milk powder added to the ration will assist both growth and the general health of the chickens. If milk feeding is continued to maturity there is the likelihood of the pullet maturing and beginning egg production before she has attained the desired standard of size consistent with breeding qualities. Such feeding can be carried out with advantage with October-hatched stock, because late-hatched stock are not usually intended for breeding purposes, simply to fill requirements as laying stock to make up for possible shortages on stock.

A general plain ration without undue forcing can, with good management and housing, be relied upon to produce pullets possessing health and, if of good laying strain, a body well developed and well fitted for the purpose of egg production. Such stock, when selection for breeding purposes has been practised with an eye to standard requirements, will later provide stock with which to replace stock culled out at the completion of their usefulness as breeders to replace breeding birds for future use.

Green Feed

One cannot overstress the value of succulent green feed for growing stock. A comparison between pullets raised where liberal supplies of green feed, such as watercress, silver beet, lettuce, or freshly-cut clover and ryegrass, have been provided with those raised on a short ration of these commodities will disclose the advantage in growth and leg colour, besides ensuring health and vigour.

The feeding of green food also cheapens the cost of production. The writer prefers the proteins found in succulent green food to that supplied by animal proteins for the purpose of raising young stock. Generally speaking, the value of green feeding is definitely discounted or perhaps not completely understood; otherwise more provision would be made to ensure that adequate supplies of this cheap foodstuff are available throughout the growing stages.

Carrots

Red carrots are a really good standby for winter and autumn feeding They are readily eaten because they provide a substitute when regular supplies of fresh green material are often unprocurable, and they are generally preferred to mangolds or other root crops.

When soil conditions are favourable, such as a well-drained fine loam, carrots can easily be retained in usable condition much longer by leaving them in the ground. When second growth manifests itself the roots can still be retained in a fresh condition by simply cutting the crowns off with a dutch hoe just below the ground. By this means the roots will retain their freshness and will be relished by the breeding hens once they became accustomed to them.

—H. L. COCKER, Poultry Instructor, Christchurch.

APIARY NOTES—Continued from page 301

under normal conditions, and when they are present in large numbers in the hives it is a sure sign that the colony is queenless and contains laying workers. When these conditions are present it is best to unite the colony to a queen-right hive rather than attempt to re-queen in the ordinary way.

The only way a caged queen can be successfully introduced and make progress in a queenless hive containing laying workers is to give the colony one or two combs of emerging brood, according to the strength of the colony, at the time the queen is placed in the hive. This provides the colony with a small force of nurse bees, and the queen's efforts are not wasted, but progress is very slow under these conditions.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

Cost of Rearing Pullets for Flock Replacement

E. R. MARRYATT, Fields Instructor, Ruakura Animal Research Station.

ON April 1, 1939, at Ruakura Animal Research Station, 73 White Leghorn pullets were added to the flock, which had just been severely culled. This article shows the cost of rearing these pullets up to that date, from which date their cost is included in that of the flock of experimental birds. No account is taken of labour or of depreciation on buildings.

On November 25, 1938, 75 pullets hatched on September 21, 1938, were purchased from the Poultry Station Wallaceville, at 6/- each. Freight on these birds was £1/16/-, plus 3/6 for the return of crates. The landing cost was, therefore, £24/9/6, or 6/6 per pullet.

From November 25 to March 31 they consumed 1097 lb. of mixed meals and 896 lb. of grain. The meals and grain were mixed by weight in the following proportions:—Meals: Pollard, 15; bran, 2½; maizemeal, 6. Grains: Wheat, 3; kibbled maize, 1.

The amount of each meal and grain actually used and the costs (including freight) are as follows:—

Kibbled Maize ..	224 lb.	£1 9	8
Pollard	700 lb.	£2 14	3
Bran	117 lb.	7	5
Maizemeal ..	280 lb.	£1 15	7
Wheat	672 lb.	£4 2	6
Totals ..	1993 lb.	£10 9	5

The pullets began to lay on February 14, 1939, and their weekly production of eggs, the ruling price and the value of the eggs laid is tabulated as follows:—

Week ending	Eggs laid	Price *	Value.
17/2/39	11	1/6½	1/3
24/2/39	27	1/6½	3/6
3/3/39	60	1/6	7/6
10/3/39	90	1/6	11/3
17/3/39	104	1/6	13/-
24/3/39	144	1/6	18/-
31/3/39	150	1/6	18/9
	586		£3/13/3

* Price for 2nd Grade A eggs sold through the Waikato Egg Pool.

The purchase price of the 75 pullets was	£22	10	0
Freight amounted to	£1	19	6
The total cost of feeding was	£10	9	5
Therefore the gross cost of the pullets was	£34	18	11
But the value of the eggs laid was	£3	13	3
And so the net cost of rearing the 75 pullets was ..	£31	5	8
But 2 birds having died, only 73 remained for flock-replacement and so the net cost per pullet for flock-replacement was		8	7

Selection and Management of Breeding Cockerels

ONE cannot emphasise too strongly the need and value of good breeding cockerels for the future welfare and success of the plant. Yet, strangely enough, this is often a section of farm work where the most neglect and lack of interest manifests itself. It should be realised that the male bird has at least a 50 per cent. influence on the progeny, and therefore every effort should be made to rear cockerels possessing size, breed characteristics, and constitutional vigour.

With the advent of the sexing of day-old chicks, many poultry-keepers unwisely lean on the fact that a percentage of cockerels will be found among the pullets, and use the best of them for breeding purposes. As with all classes of stock, a wide range is essential if one is to secure a good selection.

In order to obtain superior breeding cockerels, it is a wise plan to set aside the best male and mate him to proved hens of sound constitution, possessing breed qualities and plenty of size. The bulk of these cockerels could then be kept for selection, after which the culls should be sent to the market for table purposes. This will provide more room for the selected birds, which will profit accordingly.

Management

Cockerels for breeding purposes do best when placed on range, preferably among scrub or trees, where the younger and weaker birds can find shelter from the stronger birds. These conditions will prevent much fighting and/or the saving of valuable birds.

The usual practice of feeding in troughs may be supplemented by providing a feed hopper containing grain, which may be placed within the house and is available to any of the birds which may be chased and harassed by stronger ones.

Care should be taken to see that the birds are kept free from parasitic life by the application of nicotine sulphate to the perches, as it is only the observance of all details connected with management of birds which makes it possible to raise stock of good quality and fit for the breeding pen.

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Plan To Make Farmers Of Schoolboys

W. G. BROWNLIE, Hon. Secretary, Wairoa Club.

IT IS generally recognised that one of the most urgent problems confronting the farming community is the difficulty of attracting young fellows seriously to consider farming as a suitable occupation for them in life. Most young men when they are approaching the age where it is necessary for them to come to a decision regarding their occupation in the future discard farming as the other fellow's life; and while it is not possible to discuss in this short article the tragedy of the unattractiveness of farming to the young man, it is proposed to discuss the means available to retain the interests of those young men who are rural minded.

It is well known that the farmer's "brainy" son is usually sent to town to enable him to make the most use of his ability, and it is equally true that very often town lads are sent to the country because they are "unsuitable" for office positions. What a tragedy! We can use all the brains that are available in the country, and any other help as well; we need a far larger rural population.

This problem of enticing young fellows to maintain any interest in farming is deep-rooted, and needs every consideration in the immediate future, and that is where the Young Farmers' Clubs can materially assist. Let me outline a simple scheme which has been adopted by the Wairoa Club, Northern Hawke's Bay.

During the school vacations the boys who are taking an agricultural course at the District High School are to be given the opportunity of spending a period of their holidays on farms, not as guests, but not as labourers. They are expected to assist the farmer wholeheartedly and so to compensate him for the expense of the board and time made available to the lad, but, on the other hand, the farmer is not expected to have the boys because he can get some scrub or blackberry cut more cheaply than under the Government 75 per cent. subsidy scheme. The idea is simply to give the boys an opportunity of gaining some practical experience and, if possible, to give them the means of making contacts in the country which may prove of value when school-leaving time approaches.

This scheme, which was the suggestion of a master (who is a Y.F.C. member) at the Wairoa District High School, was inaugurated as an experiment with six boys during the August holidays, and the biggest obstacle in the way of success was the "apathy of the farmers to assist." In spite wide publicity in the Press, not one voluntary offer was made by a farmer to take a lad for the short term of one week.

However, we have greater faith in the farmers than to drop the scheme, and we believe that with personal contact we may be able to place all the boys who will be willing to become "countrified" during the summer holidays—and we expect that number will be 25 to 30. Just what results this scheme may bring about we don't know, but we are optimistic enough to have every faith in its possibilities, and we are sure that the boys will get more than a change of air from their stay in the country.

If our club in this district can successfully launch this proposal, then it is possible for every club in the vicinity of a high school to adopt a similar plan. It is essential that every available young man be interested in the soil and in the Y.F.C. Movement, and here is a way that we can do both things—gain members and make farmers.

The results of this summer's experiment will be submitted to the Organising Secretary for publication in the "Journal," and should we prove successful—and we know we shall—then concrete examples of the workings will be made available. The adoption of a national proposal along similar lines would certainly give the federation an opportunity of doing something worth while for the land, and it would indeed be a wonderful contribution towards a saner country outlook for future guidance.

Dannevirke Club's Activities

K. BATEMAN, Hon. Secretary, Dannevirke Club.

DURING recent months the Dannevirke Club has been very active. At the July meeting Mr. F. J. S. Holden addressed a good muster of members on phosphates in New Zealand, making special reference to the investigations into the possible uses of silico deposits in this country.

Tree Planting

The Dannevirke A. and P. Association welcomed the club's offer to plant an avenue of trees on the Showgrounds, and the tree-planting was completed early in July. Mr. M. R. Boothby, curator of the local Domain, supervised the planting, and his ex-

perience was particularly useful in selecting trees suitable to the district and in keeping with the object to have in years to come a worthy memorial to the 1940 Centenary. Thirty specimen trees were planted, being selections of silver birch, oaks, maples, New Zealand beech and kowhais. Mr. G. J. J. Buchanan donated the trees with the exception of the kowhais, which were donated by Mr. C. J. Wiffin. A working bee was held, and in order that the trees will have a good chance each plot was thoroughly dug and farmyard manure well dug in. Each plot was fenced in with fine netting.

Stock Drive For Red Cross

There was no lack of enthusiasm when it was suggested that the club organise a stock drive in the Dannevirke area for the Red Cross Appeal. Members were grateful for the opportunity to do something to assist this appeal, and threw in their whole weight. The district was divided into areas, and with the help of farmers, controllers were appointed to canvass each area. A wonderful response was the result, and donations and proceeds of stock sold realised £1460. The stock firms, carriers, and drovers offered their assistance, and it was with pleasure that the club was able to hand this sum to the Patriotic Society without any deductions for expenses. It was due to the keenness of members and the generous assistance of the farmers that this appeal was so successful. This amount is included in the Dannevirke and District's appeal, which has now reached £7000 for the special Red Cross Appeal.

Oroua Downs Club's Field Day

A SUCCESSFUL field day was recently held by the Oroua Downs Club, and was attended by approximately 100 members and farmer friends and several visitors from neighbouring clubs.

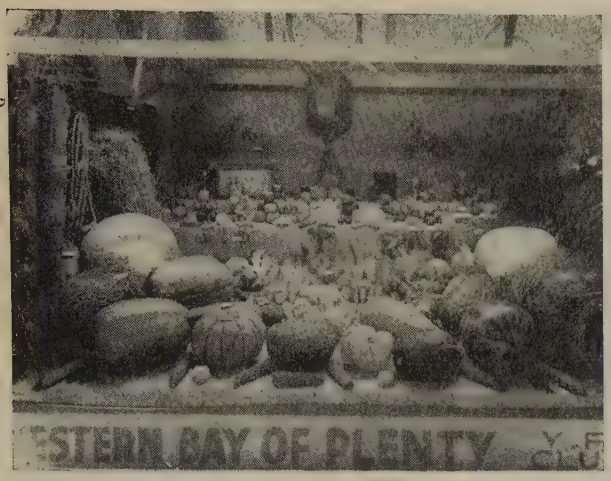
The programme was as follows:—On Mrs. Raikes's farm: Lecture and demonstration on Friesian stock by Mr. J. Liggins, Tokomaru; lecture on pigs by Mr. G. M. Whitelock, Newbury. At the sports ground: Lecture on herd improvement by Mr. E. P. Nielsen, Tiakitahuna; lecture and demonstration on Clydesdale horses by Mr. V. Bird, Oroua Downs; post-mortem of diseased animals by Mr. Gilder, Palmerston North. At the hall: Lecture on grassland farming by Mr. L. Earle, Department of Agriculture.

The demonstration on Clydesdale horses by Mr. V. Bird, Oroua Downs.

The demonstration on pigs by Mr. G. M. Whitelock, Newbury.

Results of stock-judging competitions are as follows:—Friesian cows, J B. Fowler (Bunnythorpe), 1; M. Moffitt, M. Mills, and R. O. Gloyne, 2, equal. Pigs: C. S. Anderson and E. N. Pederson, 1, equal; T. Richardson, 3. Clydesdale horses: E. Beazer (Feilding), 1; R. O. Gloyne (Rongotea), 2.

Luncheon arrangements were in the hands of a capable committee. At the conclusion of the day the club chairman (S. Boyden) thanked all who had attended and the various lecturers, and also Mrs. Raikes for the use of her farm, Mr. R. Craig for the use of his Clydesdale horses, and Messrs. R. Craig and Waller Bros. for providing cows which were killed for the post-mortem examination.



The Western Bay of Plenty exhibit, the winning display.

The Rotorua exhibit.

Auckland Y.F.C. District Courts Competition

E. M. OJALA, Hon. Secretary, Auckland Y.F.C. Council.

A FURTHER competition for the Kempthorne Prosser Challenge Shield was held at the Waikato Winter Show, when four entries from Western Bay of Plenty, Rotorua, King Country and Waikato were received.

Features of the various displays were the excellent exhibits of farm products, varieties of timber, natural products, such as coal, marble, and gum, and many items of handwork related to the various farm crafts.

On the whole, the general display showed marked improvement over that of the previous year. However, many points can still be won by closer attention to this aspect of the exhibits.

After very careful examination, in which attention was paid to such features as farm produce, attractiveness of layout, originality in design, farm-crafts, and representation of other district activities, the judges—Messrs. J. Ballard and D. E. Waide—made the following awards:—

Western Bay of Plenty (185 points)	1
Rotorua (1939 winners) (128 points)	2
King Country (115 points)	3
Waikato (90 points)	4

Congratulations are extended to all competitors upon the excellence of their displays, and particularly to the Western Bay of Plenty for the exceptional skill with which the court was prepared.

The King Country exhibit.

The Waikato exhibit.

Canterbury Council Inter-district Debate

R. INCH, District Secretary, Ashburton.

THE first Canterbury Inter-district Debate was held in the Ashburton Technical High School Hall on August 7 between teams representing the Christchurch, South, and Mid-Canterbury districts. Mr. J. Fleming, Chairman of the Mid-Canterbury District Committee, welcomed the visitors and introduced the judge, Mr. E. J. Woods, of the Ashburton Debating Union. He also introduced Mr. H. G. Stephens, Chairman of the Canterbury Y.F.C. Council, who presided for the remainder of the evening.

The subject of the first debate was "That Large-scale Co-operative Farming is in the Best Interests of the Country." The affirmative was taken by the Waihaorunga Club, J. Barclay (leader), I. Hurst, and C. Whatman, representing South Canterbury, and the negative by the Ashburton Catholic Club, R. Ross (leader), Father Daly, and M. Crequer, which generously provided a team to replace North Canterburty, which was unable to be represented.

In the second debate, "That the Trend Towards Mechanised Farming Today Tends to Affect Adversely the Position of the Farm Labourer," the affirmative was taken by the Darfield Club, J. W. Stewart (leader), K. Jarman, and H. Evans, representing Christchurch, and the negative by the Hinds Club, E. Rhodes, (leader), E. Withell, and L. Watson, representing Mid-Canterbury.

At the conclusion of the debates Mr. Woods summed up the points gained by the various speakers and gave many helpful criticisms. The points given were as follows:—

South Canterbury	292pts	1
Mid-Canterbury	280pts	2
Christchurch	269 pts	3

Votes of thanks were passed to the judge, the timekeeper, and the Catholic Club team, and the meeting then adjourned to the school kitchen where, through the generosity of Miss Vestey, the domestic science mistress, supper had been arranged.

Classes in Sheep Shearing.

CLASSES for instruction in sheep shearing and handling of machines have been held during September at the Ruakura Animal Research Station, and it has been arranged for further classes to be held during November.

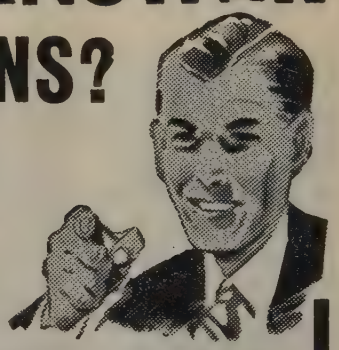
The classes aim at giving farmhands and others initial training in machine shearing so that they may be able to assist with the shearing of small flocks and take the place of men who are serving in the military forces.

Learners may board at Ruakura, and the charge for board will be 4/- per day; learners who do not board at Ruakura may obtain midday meals for 1/3 per meal. No charge will be made for tuition.

The exact dates for instruction in November will depend on the weather and the number of applicants. Hours of instruction will be from 7.45 a.m. to 12 noon, and 1 p.m. to 5 p.m.

Application should be made by October 31 to the Superintendent, Ruakura Animal Research Station, Hamilton, and details should be given as follows:—(a) Full name and address; (b) Age; (c) Whether applicant wishes to board at Ruakura or obtain midday meals. In the case of applicants residing in the Waikato, telephone number should also be given if possible.

CAN YOU ANSWER THESE QUESTIONS?



A How does the question of "natural increase" of live stock arise in connection with stock securities?

B Is a Mortgagee liable for Local Body Rates?

C What are the arguments for and against a standard valuation of live stock for the purposes of keeping accounts?

WHO WILL BE THE SUCCESSFUL FARMERS OF TO-MORROW ?

20 YEARS AGO

Practical experience and hard work were enough to bring success to most farmers.

TO-DAY

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Space does not permit giving further details here. But this is your opportunity to send for the complete Brochure which is offered to progressive and ambitious readers of the "Journal of Agriculture," without obligation and without cost.

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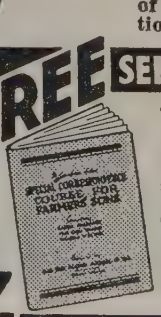

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Dear Sir,—I am interested in Farm Finance and Accountancy. Please send me without obligation your Association's Brochure and details of your home study course.

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Tree Planting by Masterton Club

C. A. MACKAY, Club Reporter, Masterton Y.F.C.

CONSIDERABLE interest was taken in the Masterton Club's Centennial Memorial tree-planting at the Solway Showgrounds on June 15. Two dozen maples of several varieties were planted, one dozen in a block to form an avenue, and the others in various parts of the grounds.

The first tree was planted by Mr. R. E. Gordon Lee, President of the Masterton A. and P. Association. In calling on him to plant a tree, Mr. J. S. Mackay (Club Chairman) said that it was fitting for the first to be put in by the President of the A. and P. Association, and that no more suitable place than the A. and P. Showgrounds could be found for the Y.F.C. Centennial Memorial. In reply, Mr. Lee said he believed trees to be the most suitable memorial to the memory of the early settlers of the district. Having planted the first tree, Mr. Lee expressed the hope that, as the tree grew so would the Young Farmers' Club flourish!

Mr. R. E. Gordon Lee, President of the Masterton A. and P. Association, plants the first tree.

Left: Mr. W. James, Wairarapa District Chairman, plants his tree. *Middle:* Mr. W. F. McLaren, Past Dominion President, plants a tree. *Right:* A view of the operations.

Trees were then planted by the following:—Messrs. W. James (President of the Wairarapa District Committee), N. Blatchford (Advisory President, Masterton Y.F.C.), and W. F. McLaren (Past President of the Y.F.C. Federation). Mr. J. S. Mackay also planted a tree, and then each of the club members in turn.

The trees will be under the control of the caretaker, and for this reason it was considered unnecessary to protect each tree with netting. Each member brought along an old piece of galvanised piping (4 to 5 feet long) for use as stakes to tie the trees to.

The Masterton Club is gratified with its modest effort to establish a Centennial Memorial, and awaits with interest details of what other clubs have done in this direction.

Cambridge Club's Field Day

F. J. SEARLE, Hon. Secretary, Cambridge.

A SUCCESSFUL field day followed by a football match was held recently by the Cambridge Club. Members of the Kakepuku Club were met at Cambridge, and the whole party travelled to St. Peter's School by car, where they were met by the bursar, Mr. Gibson, who showed them over the modern 200-acre farm. Members were first shown the imported Red Poll bull, and then the implement sheds. The modern villa for the farm staff was also inspected, the main points being the ample bathrooms with hot and cold showers, and a seperate furnished room for each man, and also a large commonroom.

The party then proceeded to the model milking shed with its pasteurising and milk-chilling equipment. Mr. Gibson gave a short talk on the methods of farming adopted on the school farm, and explained how the tubercular-free herd was maintained, and also detailed the tests being undertaken in an attempt to obtain an abortion-free herd.

The party was then shown the piggeries and the poultry section. Here was seen a whole lay-out which was portable, all the large houses and even the shed containing the feeds and grain and utensils being built on runners, and being shifted frequently by the tractor. It was explained that, although a large number of poultry are kept, they are entirely free of disease, and also that the droppings, which have a high fertilising value, are evenly distributed over a number of fields in rotation.

The party next viewed the sports field and swimming bath, which has a filtration and aeration plant to keep the water perfectly clean, thus saving the usual frequent changes of water. From there members proceeded to the school, being shown the large orchards and nursery on the way.

The party was shown through the school, which is set among beautiful old trees and is designed to combine the old English style of architecture and beauty, with the most modern ideas of hygiene, comfort, and utility. The kitchens, laundry, and central heating are all electric. The party was shown the automatic electric control system, the only one of its kind in New Zealand. It enables a comparatively small amount of current to be used on the peak loads; at night the school uses more power than the town of Cambridge. Members were also shown the chapel, with its modern electrically operated and controlled pipe organ. At the conclusion, Mr. T. Bremmer, the Cambridge Club president, thanked Mr. Gibson and also Mr. Broadhurst, who is owner of the school.

The party then proceeded to Cambridge, where the local club entertained the Kakepuku members to luncheon. After luncheon a football match was played between teams from the two clubs before a large attendance of spectators. The opposing packs of forwards were very evenly matched, the scrums and line-outs being keenly contested. The Cambridge backs, who handled the ball magnificently and kept the play well opened up in spite of muddy conditions, won the day for the home team, the final scores being Cambridge 23, Kakepuku 3.

An Appreciation from Northern Ireland

THE following letter has been received from Robert Gamble, a member of the United Kingdom Young Farmers' team which toured Australia and New Zealand in 1938:—

"I was agreeably surprised some time ago to receive from Major Hiles (secretary, British Federation of Y.F.C.) the cup you sent to me in connection with the stock-judging competition in the Wairarapa. I must say that it is appreciated very much, and will be long treasured as an excellent reminder of the wonderful tour we enjoyed with members of your team and of the very enjoyable visit to New Zealand as guests of your clubs.

"Much has happened since we returned, and we are once again at war. It has greatly disorganised everything here, and farming has not escaped lightly. We are now busy breaking up as much grassland as possible to try and produce a lot of the wheat and animal foodstuffs normally imported.

"Last winter I toured most of our clubs, giving an illustrated talk on our tour of Australia and New Zealand. The slides were made from the photographs we had taken, and great interest was aroused everywhere, especially in your pastures and fat-lamb industry. You can rest assured that God's Own Country was well upheld—only I didn't meet many who agreed with the idea of keeping the girls out of the clubs!

"Just before war broke out I was delighted to have one of your Young Farmers, Jack Gayford (Kairanga Y.F.C.) call to see me. After visiting the Royal Show he made a tour of the United Kingdom.

"I still keep up correspondence with some of your members, and enjoy your fine 'Journal of Agriculture,' which one of them sends to me regularly, and by it I follow the activities of your clubs.

"Again I must thank you for the wonderful time I spent in New Zealand as a guest of your Federation, and also for the cup so kindly sent.

"Wishing you every success with the Y.F.C. movement in New Zealand, and also a Merry Xmas.

" remain, etc.,

ROBERT GAMBLE,
Ballyminstra,
Bangor, County Down,
Northern Ireland."

Wairarapa Clubs' Efficiency Contest

N. LAMONT, District Secretary, Masterton.

YOUNG Farmers' Clubs are passing through rather difficult times, being faced with falling membership, restrictions on travelling, etc., and it is felt that now, of all times, it is vitally important that club affairs should be conducted with the maximum of efficiency. The Wairarapa Clubs' efficiency contest has been designed to focus attention on some of the little details that make for efficiency, which is, after all, no more than thoroughness and enthusiastic attention to all aspects of club affairs. Items that are featured in particular are:—Full and interesting reports of club activities in the local Press, attendance at meetings, support of district activities, promptness in attending to correspondence, and sending in reports, etc.

It is already apparent after two months that a big tally of points will be possible, and although one or two clubs have established a strong lead, it should not be difficult for the slow

starters to catch up if they make a determined effort. The present position is as follows:—Carterton, 60 points; Alfredton, 48 points; Martinborough, 41 points; Greytown, 12 points; Featherston, 8 points; Masterton, 4 points; Tinui, 0 points.

It is, of course, not true to assume that clubs with no points are absolutely defunct, but they have simply neglected to advise headquarters of activities they have been holding, and consequently recognition cannot be given. It is not impossible that after this is published some of the members of clubs low on the list will want to know the reason why, with the result that my inward correspondence will increase.

Among the Clubs: Reports on Activities

Western Southland.

Drummond.—General business.

Lochiel.—Business meeting.

Eastern Southland.

Crookston.—General. The speaker for the evening was Mr. S. D. Blomfield, his subject being "Topdressing." A number of questions asked by the club members were discussed by the speaker in detail

South Otago.

Clinton.—Centennial tree planting scheme discussed. Mr. A. F. Greenall, Department of Agriculture, spoke on "The Growing of Linen Flax."

Lawrence.—General. Mr. A. F. Greenall showed a number of films of an agricultural nature to the meeting.

Stirling.—A club member, L. G. Bell, was elected delegate of the South Otago District Committee to the Clutha A. and P. Association. A film display was given by Mr. A. F. Greenall, the films shown including "Salt of the Earth," "Growing Wheat in Canada," and "Clover, the Nitrate Factory of the Farm."

Warepa.—Talk entitled "Linen Flax" by Mr. A. F. Greenall, Department of Agriculture. At a previous meeting a delegate to the A. and P. Association was elected. Donation of £2.3.6 made to Patriotic Fund. Two debates held. In the first contest "Tractors" (E. Cross and J. Dodd) versus "Horses" (J. Shanks and T Joyce), the latter team was successful, while in the second "Topdressing versus Cultivating," the team in favour of topdressing was placed first. L. Christie and W. Agnew presented the topdressing arguments and A. Gordon and E. Maitland defended the cultivation method.

Central Otago.

Roxburgh.—Arrangements for the planting of trees. Mr. J. W. Woodcock, Department of Agriculture, lectured on "Manures in General," and Mr. A. C. Cameron outlined the proposed scheme to hold shearing classes during October.

Upper Clutha.—General. The speaker, Mr W. A. Scaife, addressed the meeting on "The Y.F.C. in Relation to the War Effort."

Dunedin.

Palmerston South.—General business. Mr. S. Craig, Department of Agriculture, gave lecture on "The Prevention of Diseases in Farm Animals."

West Taieri.—Tree planting discussed. A talk entitled "The Ailments of the Breeding Ewe" was given by Mr. B. A. Taylor.

North Otago.

Five Forks.—Talk by Messrs. Denize and McDonald, of the Otago-Southland Council, on "Animal Husbandry."

Hampden.—Combined meeting held. Mr. B. B. Blackmore, Agriculture Instructor at Waitaki Boys' High School, spoke on "Increased Primary Production." The speaker illustrated his lecture by means of films depicting methods of increasing production in North Otago. This was followed by an address by Mr. Grocott (North Otago delegate to the Federation's annual general meeting), in which he outlined the business discussed at that conference.

Papakaio.—Films on "Increased Production" shown by Mr. B. B. Blackmore. Mr. Grocott reported on the annual meeting held recently in Christchurch

South Canterbury.

Albury.—General. Talk by Mr. C. C. Leitch, Department of Agriculture, on "Lucerne."

Arno.—General business. An address on "Farm Accounts" was given by Mr. Struthers.

Cannington.—Sum of £6 donated to Patriotic Fund. Sub-committee formed for the purpose of finalising a scheme for mutual assistance during harvesting or other busy periods. Presentations made to two club members in the Third Echelon. Mr. Darling gave an interesting lecture entitled "Farming in the Tweed Valley, Scotland."

Geraldine.—Club debate held, the subject being "That Small Farms Are More Profitable Than Large." R. Worner, C. Burrows, K. Hibbs, L. Volckman, C. Bennet, and J. Thatcher took the affirmative, and A. Worner, M. Brenton, P. Leary, G. Sheed, C. Kelman, and D. Robinson represented the negative. The Rev. Lapsley gave his decision in favour of the former team.

Hunter.—General business. Centennial tree planting scheme discussed. Mr. Grant, the speaker for the evening, gave an address on "Linen Flax."

Maungati.—General. Mr. H. McIntosh, Supervisor Canterbury District Pig Council, spoke on "Pig Production."

Milford.—A film display by the International Harvester Company. At previously unreported meetings Mr. A. Hammond outlined his trip to the Far East, dealing particularly with life in China. A team comprising J. Woodhead, G. Crossman, and T. Crossman took the affirmative of a practice debate against the official club team, which was represented by G. Lyall, R. Dale, and R. Palmer. The subject was the one chosen for the inter-club debate, viz., "That the Present Agricultural Position Can be More Readily Improved by Lowering the Production Costs Per Unit than by More Efficient Marketing." Mr. Mulligan gave helpful criticism to the members of the debating team.

Pleasant Point.—Club team were winners of Evans Cup. A. Talbot was judged the best speaker, and the team comprised A. Talbot, F. R. Clarke, and O. R. Chapman Messrs. J Haig and Booth spoke on "To Get 'Finest' Grade with Your Cream." At a previous meeting Mr. G. McDonald gave a talk on "Europe Two Weeks Before the War," and W. S. Skinner reported on the judging competitions at Lincoln College.

Waihaorunga.—General business. Talk, "Stud Stock of New Zealand." by Mr. A. Grant.

Mid-Canterbury.

Ashburton.—Talk by Mr. Stevens, Lincoln College, on "Experiments on Lincoln College Stock." There followed a lecture by Mr. Moore, flourmill manager, describing the various processes which wheat goes through from the time it enters the mills.

Mayfield.—Business meeting.

Methven.—General business. Debate between Farmers' Union (Methven Branch) and a Lincoln College team The Methven side (which included R. Wrightman, a club member) was declared the winner. A dog trial was held on the property of Mr. R. J. Law. Mr. Law kindly supplied the sheep for the trial, and Mr. W. F. Ross acted as judge. Mesdames Law and Ross provided afternoon tea. The result of the competitions was: C. Wrightman (55 points), 1; J. Watson (53), 2; H. Poff and D. McLaughlin (each with 48 points), 3, equal.

Christchurch.

Ellesmere.—Members appointed to care for trees planted as a Centennial Memorial. Field day to be held. New member elected. A paper prepared by Lincoln College on "The Future of New Zealand Agriculture" was read and discussed.

North Canterbury.

Amuri.—The sum of £10.13.3 donated to Patriotic Fund. A "Question Box" was the chief item of the evening, all members having the opportunity to speak. There were many interesting discussions.

Cheviot.—General. Mr. Boyce gave an address on "The Method Employed in Testing the Quality of Oils." The talk was illustrated by a practical demonstration on one of the testing machines.

Hawarden.—A talk entitled "Lambing Troubles" was given by Mr. E. Siddall, Department of Agriculture. Members of the Farmers' Union were in attendance, and at the conclusion of the lecture a committee was set up to deal with "Increased Production." At a subsequent meeting "The Handling of a Flock of Ewes in Lambing Time" was discussed.

Westland.

Murchison.—Arrangements for annual dance. Club debate, "Is Sheep Farming Superior to Dairy Farming?" G. Bailey, M. Watson, and H. Ellison spoke for the affirmative, and gained the decision from the negative team, comprising C. Peacock, C. James, and A. Grooby.

Nelson.

Dovedale.—Field day to be held. I. S. Win and T. T. Cawin spoke on "My Idea of an Ideal Farm and How I Would Equip It."

Moutere.—General. A talk on "Paper Manufacturing" was given by A. Clouston, a club member.

Wairarapa.

Alfredton.—Final arrangements for radio talk. Mr. S. Freeman, Dominion Organising Secretary, gave a short lecture on "The Y.F.C. Movement," which was followed by a talkie picture display, the films being of agricultural and topical interest.

Carterton.—Inter-club debate to be held with Featherston. A talk of much interest entitled "Early Wairarapa" was given by Mr. D. McGregor.

Martinborough.—General business. Films of an agricultural nature were shown by Mr. S Freeman, Dominion Organising Secretary.

Manawatu.

Bunnythorpe.—General. Talks were given by club members as follows:—"Massey College

Short Course" (S. Anderson); "In Camp With the Territorials" (J. Wood); and "My Experiences While Herd-testing in the Taihape District" (J. Wood).

Colyton.—Sum of £15.10.6 handed to Patriotic Funds. Discussion on shearing instruction day. Mr. G. M. Moffitt, Feilding, spoke on "Fat Lambs."

Fitzherbert West.—Roll of Honour established for members on overseas service. Effort to be made to obtain new members.

Kairanga.—General. Stock judging discussed. Mr. Hill-Motion gave a lantern lecture on "Mammitis" and "Machine Milking."

Kimbolton - Kiwitea. — Shearing instructional class to be organised. A discussion took place among club members on "Seasonal Troubles."

Opiki.—General. A lecture entitled "The Care of Dairy Stock" was given by Mr. H. A. Bayley, Department of Agriculture.

Oroua Downs.—Scrap metal to be collected as a war effort. Club to start a reading library. Fee of 1d. per book to be charged. Club dance to be held. Mr. F. H. Dodson, Department of Agriculture, gave a lecture on "Bee-keeping."

Otaki-Te Horo.—General. An address on "Bee-farming" was given by Mr. F. Wilton.

Pohangina Valley.—Arrangements for shearing field day. Club members held discussions on various agricultural topics —"Onion Growing," "Pasture Improvement," "Sugar Beet," "Destruction of Fern," "Subterranean Clover," "Weaning of Pigs and Calves," and "Fencing Problems."

Rangiwahia.—Field day held for purpose of planting 40 Oregon pines on the Rangawahia-Kiwitea County Council Reserve. The plot to be named the Rangiwahia Y.F.C. Centennial Memorial.

Rongotea.—New member elected. Field day to be held. A lectuer on "Fat Lamb Production" was given by Mr. L. B. Wall

Tokomaru.—Dance to be held in aid of Patriotic Funds.

Waituna.—General business. Shearing competition to be held in October. A social and dance arranged for that evening. K. England and L. Morris gave a talk on "The Y.F.C. South Island Tour."

Wanganui.

Bulls.—General business. A lecture illustrated with films was given by Messrs. Reid and Gray, Palmerston North, on "Ploughing." A film on "Caterpillar Tractors" was also shown. At a previous meeting a suitable subject was selected for the 2Y A. radio talk.

South Taranaki.

Alton.—General. W. A. Taylor read a report on hay and ensilage judging.

Hawera.—Arrangements for club dance. The speaker for the evening was Mr. Sheat, who gave an address on "The Work of the Manpower Committee."

Kaponga.—Debate to be held. Table tennis tournament, the winner being R. Fuxton. A question night held on "Dairy Farming."

Central Taranaki.

Cardiff.—Roll of Honour to be kept of members on active service. W. Brunton and W. Morrison spoke on "Fattening Bacon Pigs" and "The Importance of Herd Testing," respectively. The meeting was then asked to criticise the talks.

Midhirst.—Club dance arranged. Radio talk to be prepared by members. A lively discussion on "Jersey Breeding" took place.

Toko.—Arrangements for club dance. A talk was given by H. Kaye on "Hay Making and Stacking."

Tarata-Pukeho.—General. Two further card parties to be held, the proceeds of which are to go to the Patriotic Funds.

North Taranaki.

Inglewood.—Donation of £5 made to the "Spitfire Fund." Centennial Memorial tree planting arranged.

Mangorei.—General discussion among members on various agricultural topics.

Southern Hawke's Bay.

Woodville.—Tree planting finalised. Sum of £1, donated to Patriotic Fund. Mr. M. D. Murray lectured on "Seasonal Troubles in Dairy Stock." At a previous meeting Mr. S. Freeman, Dominion Organising Secretary, spoke on "Y.F.C. Policy" and showed a number of sound films.

Central Hawke's Bay.

Hastings.—General business. An address by Mr. W. Tucker, of Whakatu, on "Wool."

Onga Onga.—Ways and means discussed whereby learner shearers might acquire instruction and practice during the coming season. Mr. J. K. Herrick gave a lecture on "The History of Poll Angus Cattle." At a previous meeting it was decided to donate the sum of £13.13.11 to the Red Cross Society. Trees were planted in the school grounds as a Y.F.C. Centennial Memorial. Mr. J. Waugh gave an address on "The General Care of Dogs and the Methods of Breaking in a Young Dog."

Takapau.—Profits of recent dance given to Red Cross. Another dance to be held, proceeds of which go to the "Spitfire Fund." Mr. Brown, manager of H.B. Farmers' wool store spoke on "Increasing the Wool Clip."

Northern Hawke's Bay.

Meeanee.—General. Mr. Graham gave a talk on "Main Stock and General Farming Acts," and also explained the Noxious Weeds Act.

Nuhaka.—One new member elected. The subject for the evening was "Winter Feeding of Stock as a Means of Increasing Production." The speaker was Mr. Hudson.

Wairoa.—Donation of £10 to District Committee Funds. Scheme finalised whereby secondary schoolboys may work on farms during the vacation, thereby gaining the necessary practical knowledge in conjunction with the theoretical course at school.

Poverty Bay.

Tolaga Bay.—Talks were given by club members as follows:—"Building a Circular Dip" (N. Sadler), "Increased Production" (F. Post), "Wintering Pigs" (E. Scragg). At several previously unreported meetings the following addresses were presented:—"Improvement of the Dairy Herd" (Mr. Witham, N.Z. Dairy Board Consulting Officer), "Generators and Home Lighting" (R. Scragg), "Seed Selection" (H. Irving), "Water Power for Lighting" (J. Robison), and "Introducing Subterranean Clover in Hill Country" (L. Donald).

Taumarunui.

Taumarunui.—General. Mr. W. T. Brown, Department of Agriculture, gave an address on "Pasture Control and Its Bearing on Feed Flavour in Milk."

Te Kuiti.

Mokaulti.—Talks by club members, "Sheep-farming and Its Associate Industries," "Dogs —Their Training and Care," and "Fertiliser Works." Field day held on Mr. Blundell's property. Messrs. Blundell and Hayes demonstrated on "Horses."

Otorohanga.—Motion picture display given by Mr. F. G. Johnson. Mr. H. H. Evans, Advisory President, spoke on "Cheesemaking." Two new members elected. Arrangements for club social.

Eastern Bay of Plenty.

Edgecumbe.—Short talks by members:—"Monkeys" (R. Briggs), "Superiority in Friesian Herds" (B. Shearer), "Mastitis" (D. Burgoyne-Smith), "The Telegraphic System" (G. Murray), "Points to Consider when Judging Sheep" (A. McCracken), "Expert Advice" (F. Murray), and "Gold" (O. Neilson).

Waimana.—Dance in aid of "Spitfire Fund" to be held. An address entitled "Production is a Collective Result of Individual Farm Units" was given by Mr. G. Witham, N.Z. Dairy Board.

Western Bay of Plenty.

Katl Kati.—Annual ball arranged. Mr. G. Witham spoke on "The Dairy Herd Improvement Plan."

Paengaroa.—Club birthday celebrated recently. Mr. A. V. Allo, Department of Agriculture, addressed the meeting on "Supplementary Cropping as a War Effort."

Te Puke.—Three new members elected. Talks by club members:—"Maize Growing in the Bay" (T. Tanner), "Bees" (D. McNaughton), "Insulator Works" (R. McNaughton), "Pampas Grass" (C. Winter), "Physiology of Nutrition in a Cow" (B. Caldwell), "Modern Machinery" (D. Vercoe), "Wesley College" (D. Caldwell), "Debating" (W. Pryor), "Air Raid Detectors" (J. Roderick), "Root Growing in Putaruru District" (P. Nichol), and "Mangold Growing in the Bay" (J. Nichol).

Te Puna.—Pasture competition to be held. A lecture by Mr. Snodgrass entitled "Pig Management."

Rotorua.

Putaruru.—Field day to be held. Mr. A. F. Morris spoke on "Hay Stacks," and Mr. C. S. Dalgliesh, Department of Agriculture, outlined the aims and objects of the Primary Production Council.

Waikato.

Cambridge.—Dance and field day to be held. Mr. W. S. Harbutt spoke on "The History and Early Life of the Cambridge District." At a previous meeting. Mr. S. J. Sheaf, of the Auckland Herd Improvement Association, dealt with the following subjects in the course of his address: "Herd Recording," "Surveying of Herd Sires," and "Disease Wastage in Dairy Herds."

Hauraki.—General. Mr. C. Walker, Department of Agriculture, addressed the meeting on "How to Start a Cropping Competition."

Kakepuku.—Field day arranged. Sum of £2.2.0 donated to Fighter Plane Fund. A talk entitled "Diseases in Pigs and Calves" was given by Mr. G. B. Melrose, Department of Agriculture. At a previous meeting Mr. G. S. Clarke donated a cup for the club's calf competition.

Tauhei.—Dance to be held. Scrap metals to be collected as a war effort. A debate held, the subject being "Grassland Farming v. Root Crop." The grassland supporters were I. Harris, G. Gee, K. Rowling, S. Rodgers, and I. Miller. The team speaking for root crops comprised C. Osborne, G. Harre, I. Osborne, G. Harris, and L. Brown. The first-mentioned team was given the decision.

Tahuna.—Field day held on Mr. Munro's property. Mr. J. M. Stewart demonstrated how to recognise the good or bad points of dairy heifers most suitable for a dairy farmer.

Te Awamutu.—Rules for a calf rearing competition drawn up by a special committee. Short speeches by members on the subject "Owing to the Plea for Greater Economy and Elimination of Waste. How in Your Opinion Could This Best be Effected?"

Auckland.

Clevedon.—Challenged Franklin Club to a debate. Swede growing competition to be held. Mr. Carbury spoke on "Animal Diseases."

Franklin.—General business. Debate held among members, "Should Women be Employed on Farms in Wartime?" won by the negative side. Field day held at Runciman, where Mr. Beaumont, of "Beaumont Nurseries," Manurewa, gave a lecture on "Native Trees and the Planting of Them." A number of trees were kindly donated by Mr. Beaumont.

Hunua.—General. A discussion took place on "Herd Improvement and Sire Surveys."

Harrisville.—General business. Mr. Alex. Longwill lectured on "Topical Problems of the Pig Industry."

Dargaville.

Marohemo.—General. Mr. R. W. Taylor gave a talk on "Sire Survey," and Mr. E. H. Arnold, Department of Agriculture, addressed the meeting on "How to Increase Production to Help the War Effort."

Tangiteroria.—Arrangement for field day. Discussion by members on "Ploughing Hill Country."

Health Notes for the Farm

Contributed by the Department of Health

How To Nurse Infectious Diseases In The Home

NOT all cases of infectious disease require to be removed to an isolation hospital; many can be quite satisfactorily nursed at home. It is therefore deemed advisable for the guidance of householders to issue these instructions, giving the main precautions to be taken and principles to be followed when cases of infectious disease are nursed at home.

The Sickroom

The room for the patient's use should be sunny, well-ventilated, and free from unnecessary furniture, curtains, mats, etc. It should, if possible, be near the bathroom and lavatory, and, if feasible, these should be given up for the patient's use. If the bathroom is not available, then washing facilities (at least two basins) should be provided in the room. A covered pail, a good nail-brush, and a piece of plain soap should be provided. The nail-brush when not in use should be placed in a dish and covered with some weak antiseptic solution (see later).

The room should be kept clean, and a system of moist sweeping and dusting should be instituted. A plentiful supply of old linen should be provided. This can be used instead of handkerchiefs, and can be burnt when used. If handkerchiefs are used they should be soaked in antiseptic (see later) before being removed from the room.

Nurse or Attendant

If possible, a trained nurse should be engaged; otherwise one member of the family should be exclusively detailed for nursing duties. The nurse should wear boilable clothing, with elbow-length sleeves, and an overall, head-covering, and pair of slippers. The overall should be kept hanging up just inside the room door, and should be put on whenever the nurse enters the room, and taken off whenever she leaves. The same applies to the head-covering and slippers. The overall should extend from the neck to the ankles, and the sleeves should reach to the elbows, where they should be close-fitting.

Duties of Nurse

The chief duty of the nurse, apart from the attention required by the patient, is to so carry out her isolation procedure that the danger of the other members of the family acquiring infection is removed.

The following will indicate the main points of these requirements:—

Attention to Hands

The importance of adequate hand-scrubbing cannot be over-estimated. Before removing her gown, and after attending in any way to the patient, the nurse should carefully and thoroughly scrub her hands and forearms. The hands should be scrubbed for at least two minutes. If the gown is to be removed, then they should be scrubbed for one minute, the gown removed and hung up, and then the hand-washing completed. The water should be immediately emptied into the covered pail and fresh water placed in the basin. The hands and forearms should then be thoroughly rinsed for **one minute** in an antiseptic solution (see later) which is kept in the other basin.

For wiping the hands, paper towels, which are obtainable everywhere, should be used. After use, these towels should be placed in a covered pail or into a paper bag which is pinned on to the wall. This bag, when full, can be removed with its contents and burned. No cloth towels should be used a second time without being washed. The hands should be washed each time the attendant leaves the room to visit other parts of the house.

Anyone else who enters the room should also wash his or her hands before leaving. Special care should be given to the hands if at any time they become soiled with excretions

Dishes

The patient's dishes should be immediately taken to the kitchen and placed in a pan of water and boiled. If preferred, the patient's dishes may be kept separate. In this case they should be washed and stored in the patient's room. Separate dish-towels and dish-cloths should then be provided. A special pan should be kept for the purpose so that the attendant may bring out infected dishes and put them into the pan at once. The attendant or nurse **must** do nothing else about the kitchen until their hands are washed. The patient's tray should be kept in the bedroom all the time.

Soiled Clothing

All soiled clothing should immediately be placed in a basket or galvanised-iron receptacle or bag set aside for the purpose and kept in the patient's bedroom. The basket of clothes should be brought out and the clothes immediately sterilised either by boiling or soaking in antiseptic solution for one hour. If no basket is available the soiled clothes should be wrapped in a clean sheet before removal from patient's room. When emptied, the basket or other receptacle should be immediately returned to the isolation room.

Disposal of Excreta and Refuse

Where there is a water-carriage sewerage system, excreta can be emptied directly into the lavatory. Great care must be exercised to see that the seat is not splashed, and except in diseases such as typhoid fever, dysentery, etc., the excreta may be emptied into the ordinary privy.

In such diseases as typhoid fever, an equal quantity of 1 in 20 carbolic or chloride of lime should be added, and all masses broken down and the whole allowed to stand for one hour. The excreta can then be emptied down a water-lavatory, or buried so that not more than 6in. to 12in. of soil covers them. The bed-pan or chamber should be cleansed and "scalded" after each use. All scraps of food, soiled paper, etc., should be immediately disposed of by burning.

A paper bag pinned on the wall will be found useful for depositing such things as linen soiled with sputa, etc. The bag and contents can then be removed and the whole burned. It is very important that all discharges of the nose and throat be disposed of at once. In such diseases as scarlet fever, diphtheria, and measles, the nose and mouth discharges are very infective, and great care should be taken in handling them, and they should be promptly destroyed by burning.

The attendant need not be strictly confined to the room if she is careful in her technique. Regular exercise in the open air is necessary for her own protection. Care should be taken not to inhale the patient's breath, or allow him to cough in one's face. No article of food that has been in the sickroom should be eaten by others, and anything that is removed from the sickroom must be regarded as infected and treated as such.

Books and Toys

Only such books as can be burned should be used in the sickroom, and the toys should be of such a kind that they can be readily and completely sterilised, otherwise they should be burned.

Visitors

As a rule, visitors should not be permitted, but if necessity demands that persons other than the nurse should enter the room, they should wear a gown and take the usual precautions about washing the hands.

Release from Isolation

The patient should have a complete hot bath, using plenty of soap and water, and fresh clothing should be put on.

All dishes and utensils should be boiled, all blankets should be soaked in disinfectant and then washed, and all boilable clothing should be boiled. Articles such as eiderdown quilts should be exposed to direct sunshine for at least six hours. Toilet articles, hot-water bottles, and other rubber goods which might be injured by antiseptics should be washed with soap and water and put out in the sun and air.

As one of the objects of the technique outlined has been to destroy infection as it arises during the course of the disease, the necessity of a terminal fumigation of the room largely disappears if the technique has been thoroughly carried out. The room and furniture should be thoroughly scrubbed or washed, and all windows opened so that the room gets a good airing. It is as well to air the room for two days before it is again used, and carpets, mattresses, pillows, etc., should be well "sunned" and aired. A vacuum cleaner will be found useful, and the dirt that the cleaner collects should be burned.

Children who have just recovered from certain infectious diseases, such as scarlet fever and diphtheria, sometimes carry the germs in their noses and throats, so that for two or three weeks after release from quarantine the child should sleep by itself if possible, and certainly should not sleep with other children. If the other children have been sent away from home during the course of the illness it is advisable not to let them return home until a week has elapsed after quarantine has been lifted.

Antiseptic Solutions

The following antiseptic solutions are recommended:—

LYSOL.—One teaspoonful to a pint of water—for keeping nail-brush in, washing hands in, soaking linen in, etc.

CARBOLIC ACID.—1 part in 20 of water—for disinfecting excreta, washing over bedsteads, wire mattresses, etc.

CHLORIDE OF LIME.—For disinfecting excreta.

FORMALIN.—½ pint to about 4 gallons of water—for fumigation by spraying, disinfection of excreta, soaking blankets, linen, etc. Formalin has the advantage of not being harmful to most articles.

Information as to the regulations governing the exclusion from school of children suffering from any infectious disease or who have been exposed to infection from any such disease will be the subject of an article appearing in the next issue of this "Journal."

Banish the Spectre Of Diphtheria

"Parents would be well advised, therefore, to demand this prophylactic inoculation, not only for their own children, but for all children. There seems no room for doubt that the general adoption of diphtheria prophylaxis would cause the virtual disappearance of the disease from the country. The family tragedies, the high public expense, and the waste of medical effort caused in Great Britain by diphtheria call for a united effort."

—Medical Research Council, London.

DIPHTHERIA is a serious disease at any age, but it is a particularly dangerous disease of childhood. Fortunately, it is now possible to protect from diphtheria in the same way as vaccination protects against smallpox. This may be done by giving a child practically painless injections of a vaccine which confers, with few exceptions, protection against diphtheria. Thousands of our New Zealand children have been so treated with beneficial results. Their lives have been safeguarded against a dangerous enemy.

Every child should be protected against diphtheria. The first protective injection should be administered in early life, as diphtheria is a particularly serious hazard of pre-school children. The treatment may be carried out by the family doctor.

Where this arrangement is not practicable and parents wish to secure immunity against diphtheria for their children, they are advised to apply to the local Medical Officer of Health or the School Medical Officer for the district, and arrangements will be made to have preventive treatment carried out free of charge.

Medical science has at its command all necessary weapons for a successful fight against diphtheria.

The Farm Home and Kitchen

Contributed by the Association for Country Education

Breadmaking in the Home

MANY housewives, especially those in the more scattered districts, are already finding it worthwhile to make their own bread. It may be that if delivery services and the use of their own cars have to be further reduced, even more women will find that in order to have fresh bread oftener they must bake their own. Besides this, as long as there is the need to conserve our stocks of cream of tartar, it is worthwhile to make yeast buns, rolls, and sweet and fancy breads. These really do take the place of scones and cakes.

Many women have a feeling that breadmaking is a very troublesome, lengthy and uncertain process. Actually, it really is none of these things if one understands just what is going in the dough and sees to it that the treatment given enables all desirable reactions to take place. If you give your yeast and dough the correct treatment—and by that is meant the right rising-temperature and the right amount of moisture and kneading—the risings will be quick, and the loaf, when baked, will be all that one could desire.

Basic Yeast Bread Recipes

Following is the basic yeast bread recipe and method:—

Using standard measuring spoons and cup. All utensils should be spotlessly clean. Milk, 1 cup; water, 1 cup; compressed yeast, 1 level tablespoonful, or dry yeast, ½ oz.; sugar, 2 level teaspoonsful; salt, 2 level teaspoonsful; butter, lard or dripping, 1 level tablespoonful; flour, 6 cups; ½ to ¾ flour may be wholemeal.

Chart for Breads.
(All measurements level)

Breads.	Liquid.	Flour.	Shortening.	Sweetening.	Leven.	Salt.	Egg.	Flavour.
White Bread ..	1 cup	3 cups	1 tabsp.	1 tabsp.	½ oz. Yeast	1 tsp.	—	—
Wholemeal ..	1 cup	2¾ cups	—	1 tabsp. treacle	½ oz. Yeast	1¼ tsp.	—	—
Apple Cake ..	1 cup	2¾ cups	⅓ cup	⅓ cup	½ oz. Yeast	½ tsp.	2	2 tabsp. currants, 5 tart apples, ½ cup sugar, ½ tsp. cinnamon.
Chelsea Buns	1 cup	3 cups	¼ cup	1 tabsp.	½ oz.	1 tsp.	—	Butter, raisins, nuts, sugar.
Swedish Braids and Rings ..	1 cup	3 cups	3 tabsp.	¼ cup	½ oz.	½ tsp.	½	Raisins, butter, nuts, cinnamon, sugar.
Gems (raised)	1 cup	2 cups	1 tabsp.	2 tabsp.	½ oz.	½ tsp.	½	—
Doughnuts ..	1 cup	2½ cups	⅓ cup	1 cup	½ oz.	1 tsp.	2	Nutmeg
Crumpets ..	1 cup	2½ cups	—	½ oz.	½ oz.	1 tsp.	—	Tiny pinch soda
English Muffins	1 cup	3 cups	1 oz.	½ oz.	½ oz.	1 tsp.	—	—

Straight Dough or Quick Method

(a) Measure ingredients accurately. Boil water and scald milk. This destroys any foreign ferments. Set them to cool. When temperature is 82° F. or 27° C. liquids may be used to combine ingredients. This is the optimum temperature for the growth of yeast.

(b) Add yeast to ¼ cup of the water and ½ teaspoon of the sugar, and mix till smooth, put on one side to keep warm.

(c) Sift one-third of the flour with the salt into warm earthenware mixing bowl.

(d) Add sugar and fat to milk. Stir till sugar dissolves and fat melts. When liquid is at correct temperature add the yeast and water mixture.

(e) Add liquid gradually to dry ingredients. Stir to avoid lumps. Beat

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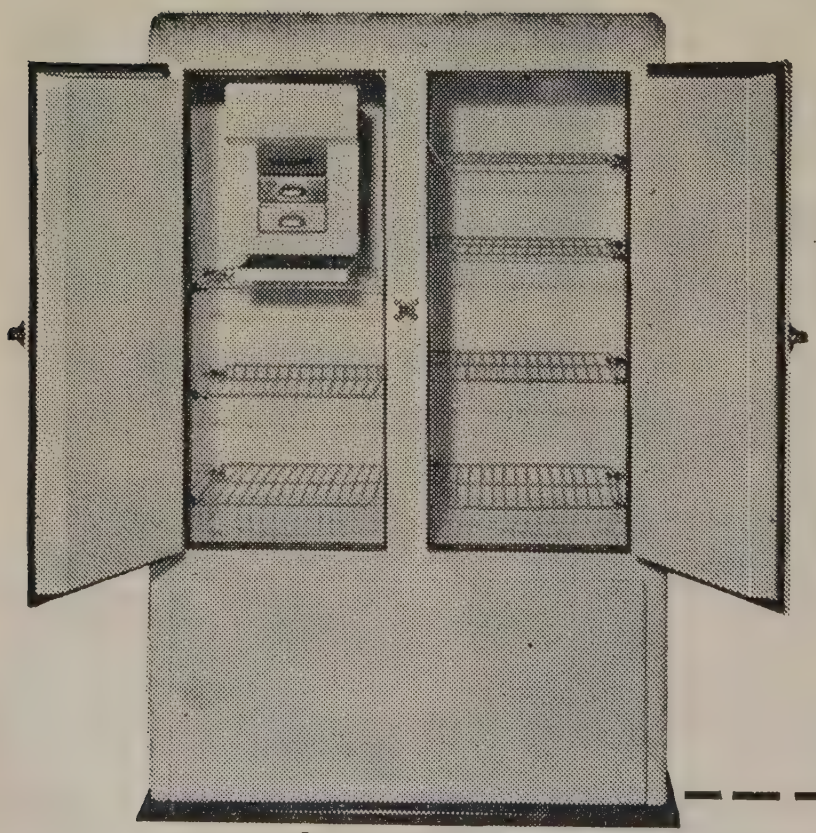

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thoroughly. Add practically all of the flour well sifted to form a **soft** dough. Beat and work with hand until dough is glutenous and cleans the sides of the bowl. (Keep dough very soft when making wholemeal bread).

(f) Turn out on to lightly floured board and let stand 10 minutes, covered with mixing bowl. Then knead quickly (about 400 quick motions) for 5 to 7 minutes. (Keep bread warm if possible while doing this).

(g) Scald out mixing basin and lightly grease it. Place dough in basin, and then turn it over, to grease dough on the top. Cover and set in warm place to rise.

(h) When the dough has doubled its bulk it is ready to shape into loaves. If, for any reason, you cannot attend to it at once, cut it down with a knife to expel the gas, and let it rise again. (A light kneading and second rising is often given as it allows for using less yeast, but it is not necessary for this recipe).

(i) Turn on to a board and knead lightly before shaping. Use little or no flour—a little butter on your hand will prevent the dough from sticking.

(j) Shape loaves, fold ends to middle and flatten. Give dough a half turn and repeat four times. Turn creases to bottom and place in lightly greased pans. Brush top of loaf lightly with fat. Set to rise again.

(k) When double in bulk, the loaves are ready to bake. If the oven is not ready, place loaves in a cold place to prevent further rising. Oven temperature 400° F. for 10 minutes, then reduce to 380° F. until baking completed. Test by tapping on bottom. Hollow sound indicates that bread is cooked. It also shrinks from side of pan.

Chart for Raised Rolls.

Raised Rolls.	Basic Sponge.	Additional Ingredients.	Method.
Parkerhouse Rolls	½ cup scalded milk, ¼ cup boiled water, ½ teaspoon salt, 1 tbsp. fat, ½oz. yeast, 1½ tbsp. sugar, 1 cup flour.	1½ cups flour	Sponge method as for yeast bread. After second kneading roll dough ½in. in thickness. Shape with scone or biscuit cutter. Make a crease through the middle of each with blunt side of knife. Brush over half with melted fat, fold and press edges together. Place on greased pan. Cover and let rise. Bake at 400 deg. F. 20 minutes. Yield 16 rolls—1½ inches in diameter.
Clover Leaf Rolls	Same as Parkerhouse Rolls	Same as Parkerhouse Rolls	Prepare dough as for Parkerhouse Rolls. When double in bulk, shape into balls about 1in. in diameter. Drop three into each section of a greased muffin pan. Brush with melted fat. Let rise and bake like Parkerhouse rolls.
Salad Rolls	Same as Parkerhouse Rolls	Same as Parkerhouse Rolls	Prepare dough as for Parkerhouse Rolls. Roll out ½in. thick. Shape with biscuit cutter. Let rise. When well puffed make a deep crease in each biscuit with the handle of a wooden spoon, press edges together. Place closely in greased pan, brushing with fat between biscuits. Cover and let rise. Bake at 400 deg. F. 15 mins.
Bread Sticks	Same as Parkerhouse Rolls	Same as Parkerhouse Rolls	Prepare dough as for Parkerhouse Rolls. Roll out and shape with biscuit cutter. Roll each biscuit with the hand until about 8in. long, keeping a uniform size and rounded edges. Let rise, bake like Parkerhouse Rolls.
Luncheon Rolls	Same as Parkerhouse Rolls	2 tbsp. fat, 1 egg well beaten, ½ tsp. grated lemon rind.	Prepare dough as for Parkerhouse Rolls. Add egg, fat and lemon to sponge. Let rise. Shape, using small cutter. Place in greased pan close together. Let rise. Bake at 400 deg. F. for 15 minutes.
Potato Rolls	Same as Parkerhouse Rolls	1 egg, ¼ cup fat, ½ tsp. salt, ¼ cup cold mashed potatoes, 2½ cups flour.	Prepare dough as for Parkerhouse Rolls, adding additional ingredients to sponge. Let rise. Shape into small rolls, place in greased pan, brush tops with melted fat. Bake like Parkerhouse Rolls.
Raised Muffins	1 cup scalded milk, 1 cup cold water, 2 tbsps. fat, ¼ cup sugar, ¾ teasp. salt, ½oz. yeast, 1 egg well beaten, 4 cups flour	—	Add fat, sugar and salt to water and milk when lukewarm. Add yeast, egg and flour. Beat five minutes with Dover egg beater. Let rise over night. Fill muffin pans two-thirds full. Let rise until rings are full. Bake at 425 deg. F. for 30 minutes.
Wholemeal Muffins	Same as Raised Muffins	Substitute 2 cups whole meal for 2 cups of flour.	Mix, let rise and bake like Raised Muffins.
Imperial Muffins	Basic Sponge	2 tbsp. sugar, 2 tbsp. fat, 1 cup cornmeal, ½ tsp. salt, ¾ cup flour.	Add additional ingredients to basic sponge. Mix, let rise, and bake like Raised Muffins.

(k) When double in bulk, the loaves are ready to bake. If the oven is not ready, place loaves in a cold place to prevent further rising. Oven temperature 400° F. for 10 minutes, then reduce to 380° F. until baking completed. Test by tapping on bottom. Hollow sound indicates that bread is cooked. It also shrinks from side of pan.

SPONGE METHOD.

Proceed as before as far as (e), then after beating liquids and yeast with one-third of the flour, cover bowl with clean cloth and leave to stand in a warm place. When risen and full of bubbles add balance of flour and continue as before.

OVERNIGHT SPONGE METHOD.

The sponge may be left to rise overnight on the rack or in any other warm place. In this case **only half the ordinary amount of yeast will be needed.**

SWEET BUNS.

1 cup scalded milk; ¼ cup sugar; 2 tablespoons butter; ½ teaspoon salt; 1 tablespoon yeast (½ oz.) dissolved in ¼ cup lukewarm water; ¾ teaspoon cinnamon (may be omitted); 3 cups flour; 1 egg (well beaten); ¼ cup raisins (quartered) or ¼ cup currants.

Method: Add butter, sugar, salt to milk. When lukewarm add cinnamon, yeast, flour and egg. When thoroughly mixed (beaten and kneaded), add raisins—let stand to double bulk. Knead down lightly and roll out ½in. thick and cut with large scone cutter; put on greased oven tray 1in. apart, let rise, brush with beaten egg and cook 20 minutes in moderate oven 375°. (Can brush with sugar and water on removing from oven).

POTATO YEAST.

Boiling water, 2 quarts; large potatoes, 4 or 5; salt, ¼ cup; granulated sugar, ¾ cup; Yeast: either 1 pint left over from previous stock or 1 oz. compressed yeast dissolved in 1 pint lukewarm water, or 1 cake dried yeast, mixed with 1 pint lukewarm water.

Method: Peel the potatoes and let stand in cold water. Then stir as they are grated into the boiling water to keep the yeast light in colour. Let cook about 10 minutes after all potato is grated. Then stir in the salt and

sugar, and when cooled to about 68° F., add yeast. Keep at this temperature for 24 hours, stirring as it becomes light and frothy. Store in glass fruit jars which have been previously sterilised. Take care to fill the jars only half full, then seal with lid and rubber. When removing jars from shelf, take great care in handling them that they are not unduly knocked, or gas will cause them to burst. Bottles with crown-caps can also be used.

MILK JELLY.

Milk, 1 cup; gelatin, 1 teaspoonful; sugar, 2 tablespoonfuls; flavouring.

Method: Soak gelatin in just sufficient cold water to cover. Then add the milk and sugar. Stir over a very moderate heat until gelatin is melted. Add flavouring, pour into wet moulds and put aside to set.

For Flavouring: The thinly-peeled rind of an orange, cinnamon bark, vanilla or ginger root may be added while cooking and then strained out. Variety can also be obtained by adding any fruit juice or essence or by using milk flavoured with cocoa or coffee.

FISH CHOWDER.

White fish, 1 lb.; cold water, 3 cups; salt pork or bacon, 2 slices; onion (small), 1; diced carrots, 1½ cups; milk, 2 cups; salt, 2 teaspoonfuls; potatoes (medium), 4.

Method: Wash the fish and cut in pieces off the bones. Cook the bones in cold water 20 minutes and strain off the liquor. Cut the bacon (or salt pork) into small pieces and fry with the sliced onion, then add the hot liquor and vegetables and cook 20 minutes. Add the fish and cook 15 minutes longer at a moderate temperature. Then add the milk and simmer five minutes. Serve with crackers.

Vegetable Salads.

TOMATO SURPRISES.

Take some firm tomatoes, cut a thin slice from the stem end of each and take out the seeds and some of the pulp, and dust the inside of the tomato cups with salt and pepper. Peel a fresh, crisp cucumber and cut it into small dice. Mix these with salad dressings and with them fill the tomato cups. Serve on crisp lettuce leaves.

For some of the surprises we can use green peas in place of the cucumber, or, indeed, any left-over cooked vegetables or even meat that we may have. As long as the mixture is well seasoned and cut in small dainty pieces we can use almost any combination that we wish.

CARROT SALADS.

Take equal quantities of cooked young carrots, small cooked potatoes and beetroot. When quite cold, cut them into dice and marinate thoroughly with salad dressing and serve piled on crisp lettuce leaves.

MIXED VEGETABLE SALAD.

This is an excellent way of using left-overs. Cut cold cooked vegetables into small uniform sized dice (potatoes, carrots, peas, french beans, cauliflower, beetroot, raw celery and minced onion—all are good). Mix each vegetable separately with the dressing and do not combine them until just before serving. Keep them in a cold place and arrange attractively on crisp lettuce leaves. They may be garnished with chopped parsley, cress or raw spinach.

A Neglected Habit

An advertisement for a well-known laxative claims such extravagant numbers of purchasers that one is appalled to think how large a proportion of the population must be suffering from constipation!

Meals eaten hurriedly with one eye on the clock, rushing for trams or trains—such habits upset regularity and cause a nervous tension that may delay indigestion and fail to stimulate natural peristalsis.

An improvement in health habits, including the drinking of an adequate amount of water, balanced meals, enough sleep at night to prevent excessive fatigue, getting up in time to allow proper attention to regular toilet habits, and a little slowing down of one's daily routine, is usually found helpful in preventing constipation.

Those who have omitted breakfast, or limited it to only a cup of tea, may find that taking a small glass of orange juice or a dish of cooked fruit and eating one or two slices of toast in the morning is effective in establishing regularity.

Under no condition should laxatives be taken without a physician's recommendations.

WALDORF SALAD.

Cut a ripe apple into half-inch cubes. Cut tender celery of an equal amount into small pieces. Combine with walnut meats and salad dressing. Place on lettuce leaves and add dressing and a garnish of chopped nuts.

ASPARAGUS SALADS.

Cold cooked asparagus tips make an excellent salad served upon lettuce, with French or mayonnaise dressing.

RAW VEGETABLE SALADS.

Until one has tried them, it is not realised how appetising the raw vegetables taste. Grate raw beetroot, carrot, turnip or swede. Season with salt and pepper, add finely chopped celery and grated onion to flavour. Either mould or place in an attractive heap upon the lettuce leaves and place a little salad dressing to the side. Garnish with finely chopped parsley, cress or raw spinach.

STUFFED CELERY SALAD.

Celery, 8 stalks; lettuce; cream or cheddar cheese; thin cream; French dressing; seasoning.

Method: Mix cheese to a creamy consistency with a little thin cream. Stuff the celery stalks with this mixture and cut stalks in pieces about one inch long. Use five or six pieces for each serving. Serve on lettuce with French dressing. Serves six.

DEVILLED EGG SALAD.

Hard-cooked eggs, 4; devilled ham, 6 tablespoonsful; chopped chives, 2 teaspoonsful; vinegar, 1 teaspoonful; prepared mustard, ¼ teaspoonful; sugar, ¼ teaspoonful.

Method: Chill eggs and cut in halves lengthwise. Mash yolks, add other ingredients. Refill egg whites, serve on cut salad greens with cooked dressing. Serves four.

FAVOURITE POTATO SALAD.

Cooked potatoes (diced), 2 cupfuls; celery (diced), 1 cupful; mayonnaise; diced apples, 1 cupful.

Method: Combine ingredients, mix with mayonnaise and serve on lettuce. Serves six.

VEGETABLE ASPIC SALADS.

Soak two tablespoonsful of gelatin (or Cellagine powdered dried seaweed) in two tablespoonsful of cold water. The sea-weed preparation is preferable, as it contains iodine, so frequently lacking in our diet. Add one cupful of hot vegetable broth drained from the particular vegetable which you have chosen to set in the aspic jelly. Season with 1 tablespoonful of vinegar or lemon juice, and ¼ teaspoonful of salt.

ASPARAGUS ASPIC.

Method: Cut off two inches of the tips and line the individual moulds with them. Cut the remainder into one-inch bits and fill the centres. Fill the moulds with the liquid and chill. Remove from the moulds on to lettuce leaves and serve with salad dressing.

TOMATO ASPIC.

Method: Small, whole peeled tomatoes may be set in the aspic. First pour a little of the liquid into the moulds and let it set. Then place the tomatoes in upside down and set them with a little more aspic. Then fill the moulds and chill. Remove on to lettuce leaves and serve with dressing. Another method is to use tomato puree, cooked, seasoned and strained tomato for the hot liquid and omit the whole tomatoes.

Uses Of Honey In Cooking

DURING the past few weeks we have received so many inquiries about honey that we determined to test out a number of new honey recipes. First we made a frozen honey pudding in the refrigerator. It was delicious but far too sweet and rich, and would have been perfect if we had put some rather acid fruit pulp or juice in with the mixture.

The recipe is for "honey parfait," and is as follows:—

½ cup of honey.
2 eggs.
1 teaspoon gelatin.
½ pint of cream.
And, it is suggested, 1 cup of fruit pulp (unsweetened)
or else
1 cup of mixed orange and lemon juice.

The method is to boil for three minutes the honey and egg-yolks and the gelatin, which has been softened in a little cold water. Allow it to cool and to begin to set. Meanwhile, beat the egg-whites stiff, and whip the cream. Then add the fruit pulp or juice to the cool egg and honey mixture, fold in first the whites and then the cream, and put all in the quick-freezing pan. It will freeze smooth without stirring, and will take up to four hours to freeze.

The next recipes which we tried were for cakes and buns, etc. We found that honey seemed to give a somewhat tougher product than sugar, so that it was more suited for cakes such as ginger breads or those having a good deal of shortening in them than for sponges, etc.

Honey Sponge.

However, the plain sponge had really a delicious flavour and was very light. The recipe for plain honey sponge requires:—

½ cup sugar.
½ cup honey.
4 eggs.
1 cup sifted flour.

The method for making honey sponge is to mix honey and sugar and boil until the syrup will spin a fine thread.

Always be careful when cooking honey not to let it boil over, as it fluffs up. Also, it is apt to burn. After the thread stage is reached pour the syrup over the beaten egg-yolks. Beat this mixture until nearly cool, then add the flour, and fold in the beaten whites. Put in paper-lined sandwich-tins and bake for forty to fifty minutes in a slow oven.

The honey, nut, and bran gems had a good flavour, but seemed rather moist. The recipe is:—

½ cup honey.
1 cup flour.
¼ to ½ teaspoon soda.
¼ teaspoon salt.
1 teaspoon baking-powder.
2 cups bran.
1 tablespoon melted butter.
¾ cup chopped walnuts.
And 1 to 1½ cups of milk.

The method is to sift the flour, salt, soda, and baking-powder, and mix with the bran. Add the other ingredients, holding back some of the milk in case it is not all needed to give a soft pastry batter. Bake twenty to twenty-five minutes in a hot oven.

Substituting Honey.

Should you wish to try substituting honey for sugar in some of your own recipes there are two things which you must remember to allow for. The first is that one-fifth of the honey is water, so that you must reduce the amount of liquid in your recipe accordingly.

The second is that honey contains some acid, so a little extra soda must be added when using honey. The amount of acid in honey varies, but in a cupful of honey there is about as much acid as there is in half to one level teaspoon of cream of tartar. All soda is twice as strong as cream of tartar, so that the soda needed for every cupful of honey is between one-quarter to one-half a level teaspoon.

Measure for measure, honey is as sweet as sugar. Therefore, a cup of honey, in spite of the fact that a part of it is water, will give as much sweetness as a cup of sugar. You should have no trouble in making honey substitutions if you take care to decrease the liquid and to add the necessary soda.

In a test with a honey jelly recipe we used honey instead of half the sugar, together with some strong apple-juice. The juice was fairly concentrated, and was made by boiling rather green apples in just enough water to cover them. Crab apples would make an ideal juice for honey jelly.

We used one cup of the apple-juice to half a cup of honey and half a cup of sugar, and we boiled it in the ordinary way and cooked it a little after it had given the ordinary test to prove that it would set. It set very well and had a beautiful yellow-red colour, more like quince than apple jelly. We turned it out about a fortnight afterwards and found its flavour delicious, but we noticed that, like honey itself, it tended to take up moisture from the air, so that there was a little liquid on top of the jar. However, if it were well sealed after it had cooled this could be prevented. Do not seal before cooling, as the steam would be kept in. If honey was to be kept for any length of time it must be stored in airtight tins or jars, or else stored somewhere where it is dry and slightly warm. Any place where salt would keep dry is a good place for keeping honey, because, like salt, it will absorb the water if the air is moist, ultimately becoming so watery that it can ferment.

As a Preservative.

Honey itself while at its normal strength is an excellent preservative, and sliced peaches, grapes, etc., can be preserved raw in jars surrounded by honey which has been poured boiling over them.

A recipe for honey pattie cakes is:—

5 oz cornflakes.
2 oz sugar.
3 oz butter.
2 oz honey.

The method is to melt honey and butter in the saucepan and pour over the cornflakes and sugar. Fill paper patty cases with the mixture and bake slowly for twenty minutes. Leave in the cases when cooked.

Honey is ideal for flavouring salad dressings, for sweetening baked apples, custards, sauces, and fruit drinks. It can be used in place of jam in jam-rolls and roly-poly pudding. One particularly delicious baked roly-poly has a filling of honey and soaked dried peaches. If you are lucky enough to have an abundance of honey you can certainly find innumerable ways of using it, each one better than the last.

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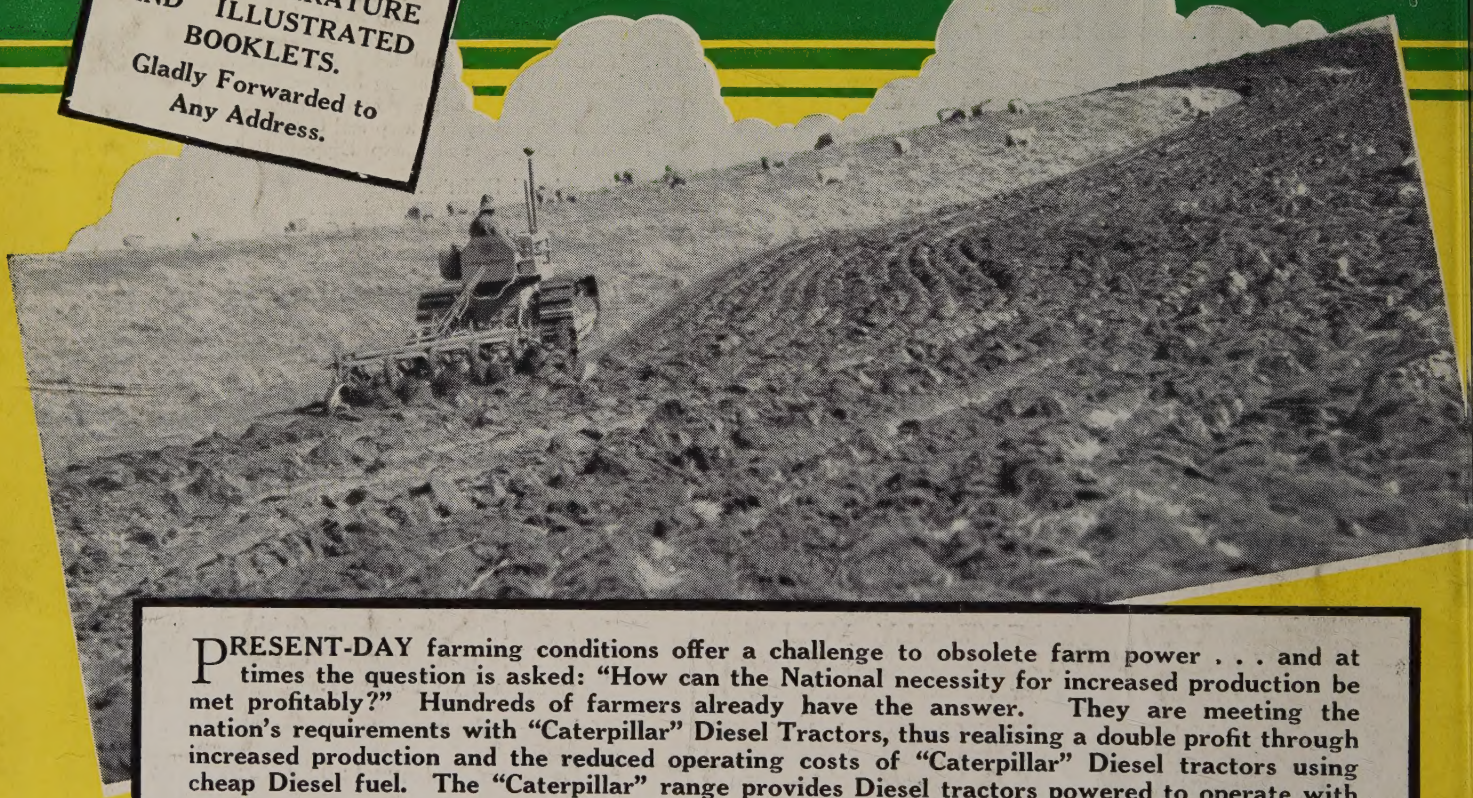

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